The pedagogy of the Massive Open Online Course (MOOC)

The pedagogy of the Massive Open Online Course: the UK view

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Foreword

The phenomenon of Massive Open Online Courses, or MOOCs, has attracted a great deal of reportage, debate and research over the past two years. One area, however, has been noticeably under-represented in these discussions: pedagogy. As learning and teaching in higher education continues to be high on the agenda of UK governments, higher education providers and policy makers alike, it is vital that this aspect of one of the most significant developments in higher education in recent years receives attention. This report provides an excellent starting point.

As the national body for learning and teaching in higher education, the Higher Education Academy (HEA) has been involved with MOOCS since their earliest implementation: the first MOOC to be named as such was the part-HEA-funded Oxford Brookes course "First Steps into Learning and Teaching in Higher Education" (May-June 2012). As at the end of 2013, 25 MOOCs had run in the UK, five of them at least twice, and as the fast-moving MOOC landscape shifts once again with the recent announcement of the first courses to be offered through the Open University's FutureLearn platform, it is timely for the HEA to be leading research that seeks answers to such questions as: what does teaching mean on courses where there may be hundreds of thousands of students enrolled? What makes for high quality teaching in this context? And what are the expectations both of academics who teach MOOCs and the students being taught?

In answering these questions, the report very helpfully makes clear that the broad categorisation of MOOCs into two types that have dominated discussion until now are no longer as useful,. Through a literature review, interviews and 'snapshots' of five very different MOOCs, the report illustrates how UK MOOCs have many different forms and intentions, and can no longer be described as a single entity or by the duality of 'cMOOCs' (broadly, a connectivist, social learning approach that focuses on communication among participants online), and xMOOCs (courses that focus more on content transmission and knowledge acquisition through repetition and testing.) Creative, open-minded approaches will be needed as the MOOC landscape develops to ensure that courses meet the needs of learners, higher education providers and those who are teaching on them.

The role of the teachers and how they can be supported in such environments is of primary concern to the HEA. The report concludes that – contrary to some media reports and research – 'the teacher persists' in the MOOC, and finds that the MOOC teacher is often required to perform multiple roles: lecturer, designer, mentor, institutional marketer, etc. in a highly visible and therefore highly risky environment. MOOC pedagogy, in other words, is not something that is just embedded in the online platform, nor is it something that can be conveniently categorised; instead, the report shows, it is emergent, diverse and must be able to continually adapt.

So what can the sector usefully focus on to support the needs of those teaching on MOOCs, and by turn, those learning on them? The authors show that pedagogical approaches to MOOCs are understandably aligned to disciplinary ways of practice. Disciplinarity has been much researched in general literature on higher education learning and teaching, but there has been little analysis as yet of these approaches to pedagogy on MOOCS, and what may or may not be working. This will be a useful focus for the future.

The report makes three policy recommendations: to continue to investigate what may be most useful regarding the accreditation of MOOCs and the implications for teaching; to encourage innovation and transformation in continuing professional development (CPD) contexts using MOOCs; and to acknowledge MOOCs as representing a significant shift to digital education by implementing policies and practices which support and foster digital literacies. The HEA supports these recommendations wholeheartedly.

In general terms, in thinking about the pedagogy of MOOCS , it will be important to continue to avoid preconceptions, in particular about what teachers in higher education 'should' and 'should not' be doing, as these assumptions may not be helpful in new environments. As the report says, "we need to be prepared to rethink how certain teacher-functions are enacted in the MOOC space, and by whom, or what." These are changing times, and we must remain adaptable to change if we are to deliver the best possible learning experiences.

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Executive summary

This report addresses the question of pedagogy within the Massive Open Online Course (MOOC): what kinds of MOOCs are currently offered in the UK; what it means to 'teach' in the open and at massive scale; and what kinds of demands and expectations are experienced by academics who teach MOOCs.

We address these issues specifically as they relate to the UK context. As the activities of the early UK MOOC innovators extend and start to become mainstream (via new iterations of existing MOOCs; the launch of the UK MOOC platform FutureLearn, privately owned by the Open University and involving 29 mainly UK-based institutions as partners; the expansion of existing platform partnerships; and the emergence of new platform options), there is value in offering a portrait of 'where we are now' at this turning point for MOOC engagement within UK higher education.

After an introduction, the report is written in four sections, briefly summarised below.

1. An overview of the current UK MOOC landscape

The emergence and current state of play of MOOCs in the UK is described here, alongside a timeline of MOOC delivery from UK universities. We trace the growth of the UK MOOC offer from the first MOOC to be named as such (the part-HEA-funded Oxford Brookes course 'First Steps into Learning and Teaching in Higher Education', May-June 2012), through the launch of the first big Coursera MOOCs (the University of Edinburgh MOOCs, Feb-March 2013), and the announcement of the first waves of courses offered through the UK FutureLearn platform (Oct 2013-Feb 2014). In summary:

- fifty-eight MOOCs are currently offered by UK universities;
- twenty-nine of these are on FutureLearn, 21 on Coursera and eight are offered without platform partnership, using CourseSites, OpenLearn and social media;
- the dominant disciplinary area of offer is Social Science (18 MOOCs), with Humanities and Medical and Veterinary Science each having 13 MOOCs; Natural Sciences offering eight, and Computing Sciences six;
- MOOC durations are between two weeks and 12 weeks; the majority category is six weeks in length;
- two UK MOOCs are currently offered for credit: First Steps in Learning and Teaching (Oxford Brookes University) and Vampire Fictions (Edge Hill University).

2. A review of key published and grey literatures on MOOC pedagogy

The literature on MOOC pedagogy is assessed and five key emerging themes are discussed:

- the troubling of the cMOOC/xMOOC binary;
- the teacher role within MOOCs;
- tensions around MOOC learner participation;
- the meanings and implications of 'massive';
- tracing the boundaries between openness and control.

3. UK MOOC snapshots

Portraits of five current UK MOOCs are provided, with an emphasis on looking at the detail of teacher practice, and on approaching the question of MOOC pedagogy from the position of the active teacher-practitioner. The MOOCs discussed are:

1 Vampire Fictions: Edge Hill University (taught by Dr Benjamin Brabon).

2 Artificial Intelligence Planning (AI Planning): the University of Edinburgh (taught by Dr Gerhard Wickler and Professor Austin Tate).

3 The Open Learning Design Studio's MOOC (OLDSMOOC): led by the Open University with several UK partners and a large team of teaching colleagues (led by Dr Yishay Mor).

4 First Steps in Learning and Teaching: Oxford Brookes University (taught by Dr George Roberts, Marion Waite, Elizabeth Lovegrove and Jenny Mackness).

5 Web Science: how the web is changing the world: the University of Southampton (taught by Professor Les Carr and Professor Susan Halford).

4. Conclusion

The conclusion of the report draws together insights from the literature review and the snapshots to emphasise three key messages and challenges for UK HE:

1 MOOCs are multiple: UK MOOCs have multiple pedagogic forms and intentions, and we can no longer define them as a single 'transformative' entity. Broad-brush descriptions of MOOC pedagogy in terms of a cMOOC/xMOOC binary are no longer representative or particularly useful. A more nuanced approach to institutional thinking around MOOCs is now needed: one which takes account of an analysis of MOOC pedagogy at a micro level of individual course design.

2 MOOC pedagogy is not embedded in MOOC platforms, but is negotiated and emergent. Multiple social and material influences converge when MOOC pedagogy is enacted: teacher preferences and beliefs, disciplinary influences, patterns of learner expectation and engagement, and other contextual factors such as institutional teaching culture or the desire to generate analytics. We need to give greater attention to MOOC pedagogy as a socio-material and discipline-informed issue.

3 'The teacher' persists in the MOOC. Though MOOC teaching functions are often disaggregated and delegated to automated processes and community-based social learning, the place and visibility of the teacher remain of central importance. MOOC teaching is high visibility, high risk and dependent on significant intellectual, emotional and time commitment from academics and the professionals who work alongside them.

1. Introduction

The aim of this report

This report addresses an aspect of the rise of the Massive Open Online Course (MOOC) which has had a tendency to be under-discussed in research, reportage and commentary to date: the question of pedagogy. What does it mean to 'teach' in courses in which enrolments can be in the hundreds of thousands? How is the art of course design played out within highly mediated learning spaces, in which the usual institutional and disciplinary rules of the game are radically shifted? What kinds of demands and expectations are brought to bear on university teachers who choose to engage with MOOC design and delivery? And what kinds of discourses and assumptions currently circulate regarding what we can expect of MOOC form, ethos and teaching quality?

We address these questions, and others, specifically as they relate to the UK context. This is for the most part because the UK MOOC scene is currently undergoing a period of significant growth. As the activities of the early UK MOOC innovators extend and start to become mainstream (via new iterations of existing MOOCs, the launch of the UK MOOC platform FutureLearn, the expansion of existing platform partnerships, and the emergence of new platform options), there is value in offering a portrait of 'where we are now' at this turning point for MOOC engagement within UK higher education.

In focusing specifically on the question of MOOC pedagogy, we do not focus in depth on other important areas of the MOOC debate: notably issues relating to policy, governance, business models and the international context for what has been claimed to be a sweeping period of change for higher education globally. Nor do we address in detail issues relating to 'learner experience', at least insofar as it is possible to separate these from the broader concern with pedagogy. These issues are addressed in other reports and commentary (see the 'UK MOOC Landscape' and 'Literature Review' sections). Here we have elected to focus on another of the UK Higher Education Academy's core concerns: the provision of evidence-informed support for the development of pedagogic practice across the disciplines. In doing so, we aim to engage not with macro-level debate largely characterised by MOOC hype and MOOC backlash, but rather with the current micro-practices of MOOC teachers, and what these might mean for the role and place of online teaching in the open and at scale.

While the MOOC landscape in the UK appears to be characterised for the most part by the keen engagement of highly motivated and committed teachers for whom this new mode of teaching is energising and on balance rewarding, we write within a critical understanding of the broader, sometimes challenging, contextual factors potentially impacting on the role of the teacher via the MOOC. Our literature review touches on some of these: the risks of the erasure of current understandings of the university teacher via the promise of 'teacher-light' massive courses; the potential for MOOCs to disaggregate teacher roles into multiple functions requiring often difficult negotiation (designer, lecturer, mentor, developer, teaching assistant and so on); and the critiques, emerging in particular within US MOOC commentary, of the involvement of MOOCs with for-profit motives, their association with the drive for budget cuts within universities and the risks some commentators emphasise of their tendency to de-value the importance of teaching and of scholarship itself (see Bady 2013 for example).

The report contains four main sections:

- an overview of the current UK MOOC landscape, illustrating the rich and to date rather neglected history of innovation in open course delivery within the UK during the period preceding our engagement with the large MOOC platforms and the launch of FutureLearn;
- a literature review which addresses key areas of concern within the current published and grey literatures on MOOC pedagogy and associated contextual issues; here we outline what we see as the most important themes currently driving the MOOC pedagogy debate;
- a series of 'snapshots' of current UK MOOCs, with an emphasis on looking at the detail of teacher practice, and on approaching the question of MOOC pedagogy from the position of the active teacher-practitioner;
- a conclusion which brings together themes from the literature review with the 'snapshots' in order to outline what we consider to be the most pressing issues the UK higher education community should be addressing in relation to MOOC pedagogy.

A brief outline of method

We generated as comprehensive a picture as possible of the current UK MOOC landscape via web searches, engagement with the literature, and a crowd-sourced open Google spreadsheet of all UK offers (described more fully in the 'UK MOOC landscape' section). In addition, we conducted Skype interviews with a selected group of academics who are, or have been, active in UK MOOC development and teaching:

- Dr Yishay Mor (previously Open University, OLDSMOOC);
- Professor Mike Sharples (Academic Lead, FutureLearn);
- Professor Leslie Carr (University of Southampton, Web Science MOOC);
- Dr Benjamin Brabon (Edge Hill University, Vampire Fictions MOOC);
- Professor Austin Tate (The University of Edinburgh, Artificial Intelligence Planning MOOC);
- Dr George Roberts (Oxford Brookes University, First Steps in Learning and Teaching MOOC);
- Marion Waite (Oxford Brookes University, First Steps in Learning and Teaching MOOC);
- Dr Angie Clonan (The University of Sheffield, Healthy Sustainable Diets MOOC).

Clearly, we took a selective approach here: as the 'UK MOOC landscape' section shows, there are very many more MOOC-active colleagues we could have spoken to. However, we chose the above – and the 'snapshots' which were written from some of these interviews – on the basis that they represent some of the variety in discipline, form and institutional context of the current UK MOOC offer. Each is engaging with a particular set of preoccupations and institutional agendas. For example, where Dr Brabon leads on a for-credit MOOC which is independent of any wider institutional initiative or platform partner, Professor Tate is offering one of the very first UK Coursera[1] MOOCs within a context of centrally-supported institutional strategic development. And where Professor Carr and his colleagues are grappling with the pedagogic design and build of a new MOOC within a new partnership and unproven platform (FutureLearn), Dr Roberts and Ms Waite were dealing with the different challenges involved in offering the first UK 'cMOOC' ('connectivist' MOOC involving a high degree of student to student interaction, as distinct from xMOOCs which are largely instructivist and outcomes-driven), with the particular pedagogic expectations that brought into play.

1 Coursera (http://coursera.org) is the currently dominant US-based MOOC platform provider, offering 542 MOOCs in partnership with an international group of 107 academic institutions.

2. The MOOC landscape in the UK

As in the US, MOOCs in UK higher education have a slightly longer history than would seem evident from the press coverage of the last year or so. Early open courses have been offered by, for example, Coventry University since 2011, and the first MOOC to be named as such – the part-HEA-funded Oxford Brookes course 'First Steps into Learning and Teaching in Higher Education' – ran for the first time in May-June 2012. In 2013 this course included an option for gaining credit for its completion. The Open University ran OT12: an Open Translation MOOC in late 2012. The early developments had more in common, perhaps, with the participative 'cMOOC' ethos of the first Canadian MOOCs than with the Coursera and FutureLearn courses which followed: the first 'xMOOCs' issued from the University of Edinburgh in partnership with Coursera and which began in February and March 2013, with the first FutureLearn courses opening in October 2013.

The full timeline provided later gives a clearer sense of the growth and trajectory of UK MOOC provision, showing all MOOCs already delivered or planned for delivery before the end of 2013, and those currently being publicised for delivery in 2014. The timeline was generated partly using a crowdsourcing method in which we used our Twitter networks to request contributions to an open Google spreadsheet. This spreadsheet is still open for amendments and updates: it can be found at http://bit.ly/17Ar00e and is reproduced in the appendix to this report.

In summary, as of the end of 2013, 25 MOOCs have been run by UK universities, and five of these have run at least twice. Another 33 are currently being marketed for 2014 via Coursera and FutureLearn. Appendix A gives fuller information about these MOOCs. Enrolments in courses run to date have ranged from a few hundred (for example, First Steps in Learning and Teaching, Oxford Brookes University) to 97,000 (Introduction to Philosophy, University of Edinburgh).

Eight of the UK MOOCs offered to date have been built outside the major platforms, via a social media mix, using CourseSites or the OpenLearn LabSpace, with the rest either taking place in Coursera or FutureLearn. No UK universities currently offer through the other current major US platforms EdX and Udacity.

University	Number of MOOCs	Platforms
University of Edinburgh	6 + 7*	Coursera and FutureLearn
University of London	4 + 1*	Coursera
Open University	4	OpenLearn, FutureLearn, social media mix
University of Sheffield	3 + 1*	CourseSites and FutureLearn
University of Bath	1	FutureLearn
University of East Anglia	1 + 2*	FutureLearn
Edge Hill University	1	CourseSites
University of Leeds	1 + 1*	FutureLearn
Oxford Brookes University	1	Social media mix
University of Reading	1 + 1*	FutureLearn
University of Southampton	1 + 1*	FutureLearn
University of Manchester	4*	Coursera
Cardiff University	1*	FutureLearn
University of Birmingham	1 + 3*	FutureLearn
University of Exeter	1*	FutureLearn
University of Glasgow	1*	FutureLearn
Kings College London	2*	FutureLearn
Lancaster University	1*	FutureLearn
University of Leicester	1*	FutureLearn
Loughborough University	1*	FutureLearn
University of Nottingham	1*	FutureLearn
Queens University Belfast	1*	FutureLearn
University of Strathclyde	1*	FutureLearn
University of Warwick	1*	FutureLearn

*indicates new MOOCs planned for 2014.

Table 1: UK universities offering MOOCs (2011-2014)

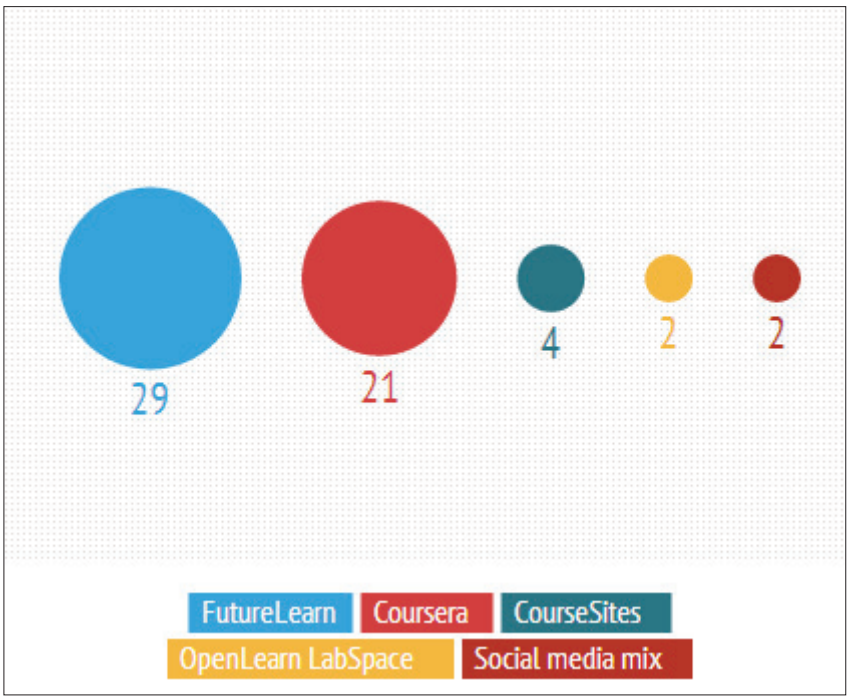

Figure 1: Shows the distribution of UK MOOCs on different platforms 2011-2014. Made with infogr.am

The disciplinary mix of the UK offer is notable, with a relatively high proportion of courses being offered in the Humanities and Social Sciences:

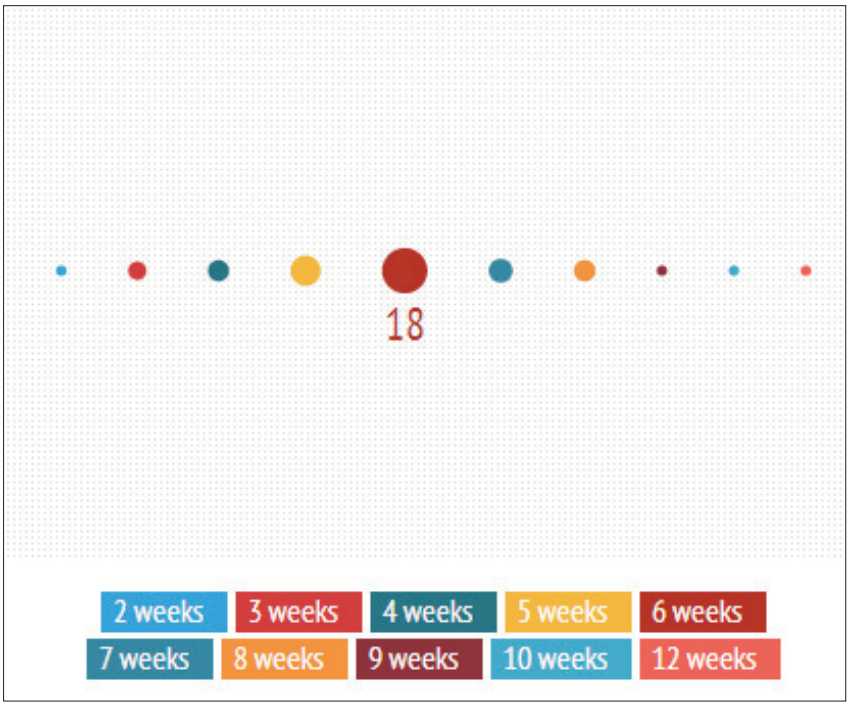

Figure 2: Shows the disciplinary mix of UK MOOCs 2011-2014. Made with infogr.am

Finally, courses tend to be short, with six-week courses being the largest grouping:

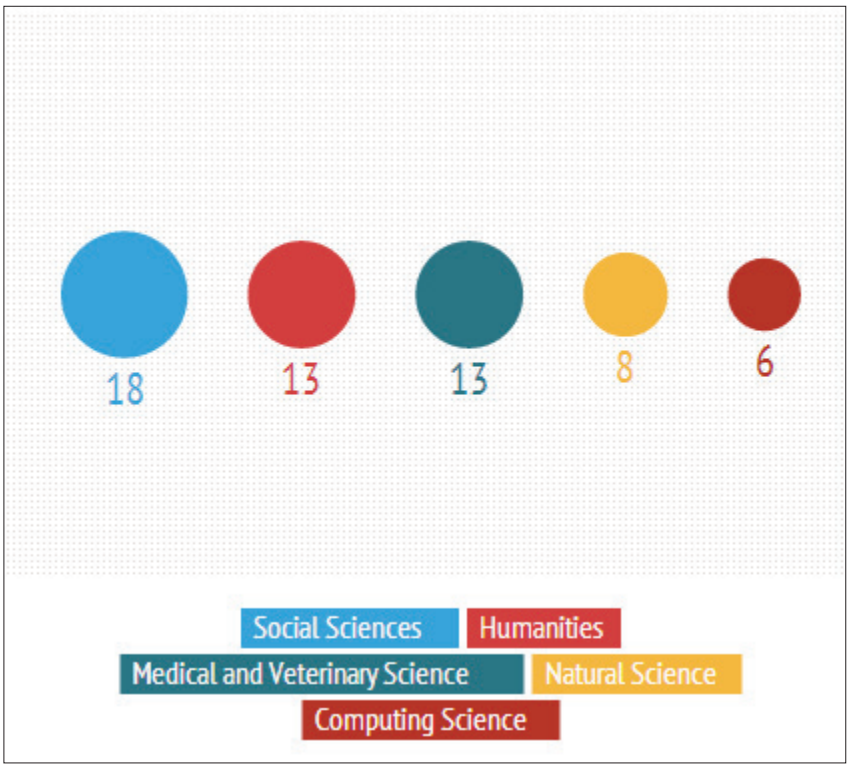

Figure 3: Shows the length (in weeks) of UK MOOCs. Made with infogr.am

There are two other observations worth making here about the UK MOOC landscape. One is that, as in the US, there appears to be a growing commitment to the accreditation of MOOCs. Two of the MOOCs discussed in our 'snapshots' (First Steps in Learning and Teaching 2013 and Vampire Fictions) offer the option to receive credit. In October 2013 the University of Central Lancashire announced it would welcome students and applicants using MOOCs as evidence of prior learning, providing its own assignments to test understanding of the equivalent course material (Parr 2013). It is particularly important to consider the implications that such innovations may have on a range of notions of 'openness'; accreditation comes along with particular expectations about the processes of designing and teaching the MOOC, and expectations about participation. These expectations may work against certain ideas of 'openness', a matter that is discussed in the literature review.

Second is the diverse spectrum of approaches to scale that we can see in relation to UK MOOCs. For example, FutureLearn is taking a cautious approach to the launch of its MOOCs, limiting numbers on each course to 10,000 in a 'beta' phase. Oxford Brookes University and the Open Brookes developments are explicitly aiming at relatively small courses in order to sustain certain pedagogical values. In the meantime, the Universities of Edinburgh and London are experimenting at the other end of the spectrum, seeking to explore what can be done with tens of thousands of participants.

Timeline of UK MOOCs

A timeline of MOOC emergence is provided here. This includes first iterations of MOOCs only.

May 2012	**Oxford Brookes University**: First Steps into Learning and Teaching in Higher Education
Oct 2012	**UK Open University**: Open Translation (OT12)
Jan 2013	**University of Edinburgh**: launch of six MOOCs through Coursera: Introduction to Philosophy E-learning and Digital Cultures Astrobiology and the Search for Extra-terrestrial Life Artificial Intelligence Planning Critical Thinking in Global Challenges Equine Nutrition
Jan 2013	**UK Open University**/collaborative: OLDSMOOC (Learning design for a 21st- century curriculum)
Mar 2013	**UK Open University**: Open education (H187open)
Apr 2013	**Association of Learning Technology**: Open Course on Technology Enhanced Learning
Jun 2013	**University of Sheffield**: Sustainable Healthy Diets
Jun 2013	**University of London International Programmes**: launch of four MOOCs through Coursera: English Common Law The Camera Never Lies Creative Programming for Digital Media & Mobile Apps Malicious Software and its Underground Economy: Two Sides to Every Story
Jul 2013	**University of Sheffield**: The Health Inequalities MOOC
Sep 2013	**Edge Hill University**: Vampire Fictions
Oct 2013	Launch of first three MOOCs through FutureLearn: **University of East Anglia**: The Secret Power of Brands **University of Leeds**: Fairness and nature: When worlds collide **University of Reading**: Begin programming: build your first mobile game
Oct 2013	**University of Sheffield**: Health Technology Assessment
Nov 2013	Launch of two MOOCs through FutureLearn: **University of Southampton**: Web science: how the web is changing the world **The UK Open University**: Introduction to ecosystems

Dec 2013	**University of Birmingham** with FutureLearn: Improving your image: dental photography in practice
Jan 2014	Launch of 14 MOOCs through FutureLearn: **University of Nottingham**: Sustainability, society and you **University of Strathclyde**: Introduction to forensic science **University of Exeter**: Climate change: challenges and solutions **Queens University Belfast**: Critical listening for studio production **University of Bath**: Inside Cancer **King's College London**: Causes of war **Lancaster University**: Corpus linguistics: method, analysis, interpretation **University of Birmingham**: Shakespeare's Hamlet: text, performance and culture **University of East Anglia**: Preparing for uni **University of Birmingham**: Good brain, bad brain: Basics **University of Glasgow**: Cancer in the 21st century - the genomic revolution **University of Leicester**: England in the time of King Richard III **Loughborough University**: Innovation and enterprise **University of Warwick**: The mind is flat: the shocking shallowness of human psychology
Feb 2014	Launch of seven MOOCs through FutureLearn: **University of Southampton**: Exploring our oceans **University of East Anglia**: Teaching computing, part 1 **University of Leeds**: Exploring anatomy: the human abdomen **Kings College London**: Understanding drugs and addiction **Reading University**: A beginners guide to English for university study **University of Birmingham**: Good brain, bad brain: Parkinson's disease **University of Edinburgh** with FutureLearn: The discovery of the Higgs boson
Mar 2014	Launch of two MOOCs through FutureLearn: **University of Sheffield**: Discover dentistry **Cardiff University**: Muslims in Britain: changes and challenges
2014 tbc	**University of Edinburgh** with Coursera: Warhol Philosophy and the Sciences Animal Behaviour and Welfare Fundamentals of Music Theory Introduction to the Clinical Psychology of Children and Young People AstroTech: The Science and Technology behind Astronomical Discovery
2014 tbc	**University of London International Programmes** with Coursera: Why We Need Psychology
2014 tbc	**University of Manchester** with Coursera: Water Supply and Sanitation Policy in Developing Countries Global Health and Humanitarianism An Introduction to Population Health Our Earth: Its Climate, History, and Processes

Related UK reports

Here we summarise some of the key publications and resources to emerge from, and in relation to, MOOC activity, as a way of signposting relevant related material, and to position this report and its contribution.

Two institutions – the University of Edinburgh and University of London International Programmes – supported relatively early MOOC emergence via Coursera, with central coordination and multiple MOOC offers. Edinburgh has published a report (MOOCs@Edinburgh Group 2013) describing the experience of running a major MOOC initiative, setting out the University's objectives for developing MOOCs and for choosing a partnership with Coursera, and summarising participation data from the first six MOOCs. In October 2013 London published its MOOC report, including some valuable 'lessons learned' and considerations for future MOOC delivery (Grainger 2013). Other reports about individual MOOCs have been written for funders (the Oxford Brookes 'First Steps' MOOC, Roberts 2012) and for course evaluation purposes (ocTEL, Harris 2013; OLDSMOOC, Cross 2013).

This work emerges during a period when a number of UK reports have also been released, offering big-picture analyses of MOOC policy and strategy implications and technology options (Universities UK 2013; Yuan and Powell 2013; Haggard 2013). Our report differs from these in its focus on MOOC pedagogy and teaching within the context of UK higher education. It is also the first report to discuss, in detail, teacher experiences of making and teaching MOOCs.

Yuan and Powell's (March 2013) white paper for JISC's Centre for Educational Technology and Interoperability Standards (CETIS) focuses in particular on MOOCs as an example of open education, and explores the extent to which MOOCs are part of a growing trend toward openness (p.5). The authors describe MOOCs as offering institutions opportunities for 'expanding access to HE to all', creating space for 'experimentation with online teaching and learning', enhancing institutional reach and reputation, and analysing and exploiting the large and potentially valuable datasets that MOOC activities produce (pp.8-9). Learner motivations are also explored, but teacher perspectives are not mentioned: presumed to be identical to those of institutions, perhaps, or to be irrelevant because MOOCs 'rarely include the central role of the instructor or teacher' (p.11). Our report demonstrates that this is not the case, and that MOOC teachers' motivations, perspectives and experiences are rich and complex. The teacher's role may be different in a MOOC from other educational settings, but it is both significant and neglected.

The authors indicate that MOOCs are disruptive innovations in some respects, but because education is a 'complex system', 'MOOCs cannot replace existing universities in the same way as iTunes replaced CDs in the music industry' (p.14), although they offer the 'online university' as a desirable future for openness in higher education. However, in the Open University's *Innovating Pedagogy* 2012 report Sharples et al. highlight the enthusiasm evident at a recent EdgeX conference in India for open courses such as MOOCs to 'provide at least a partial solution to some of the scaling issues in Indian education' (2012: 20).

The Universities UK (UUK) report, subtitled 'Higher Education's Digital Moment' and published in May 2013, positions MOOCs as both significant in their own right, and as catalysts for sector-wide change: the 'shift to digital' seen in media and entertainment industries may be triggered in higher education by the growth of MOOCs (p.22). It maintains that all higher education institutions will therefore 'need to evaluate their long-term strategies in light of these developments' (2013, p.2), and recommends that institutions consider the potential impact of MOOCs on communicating knowledge, diversifying recruitment, and improving quality (p.3). At the same time, it acknowledges that these opportunities will require profound organisational change. It also notes that 'many aspects of higher education cannot readily be substituted online for free alternatives' (p.25), but claims that the impact of the MOOC may be profound

even in such areas (naming academic support and accreditation as two of these). One such impact may come if four elements of higher education become 'unbundled': content, delivery platform, feedback and support, and awards (p.26).

The UUK report provides data on the levels of venture capital investment in education technology, showing how this has shot up since 2009, from $287 million (USD) to over a billion dollars in 2012 (pp.10-11), and speculates on the possible revenue models that might eventually recoup this investment, including through various forms of accreditation. Drawing conclusions from international MOOC developments (in practice, mostly originating from North America), it covers MOOC pedagogy in a general way, noting that while a couple of models have become relatively well established, there is much experimentation and innovation in evidence (p.17). Of the course design most frequently seen in the really big courses (with tens of thousands of participants), it observes that:

> While the [video lecture and automated quiz] model is basic and may not be suitable for all courses or represent leading pedagogical practice, it is accessible, flexible and scalable to large volumes of diverse students. (p.15)

While issues around pedagogic quality and scale are acknowledged in the report, and different concepts of participation lightly touched on, nothing is said of the role of the teacher, or critical tensions around massiveness and openness. There is also little in the way of specific analysis of individual MOOCs; again, this is a gap that our report addresses.

The UK Department for Business, Innovation and Skills published a literature review of MOOCs in September 2013 (Haggard 2013). Including a range of published and online material up until May 2013, it offers summaries of a number of perspectives from across academic, online and commissioned literature, identifying key issues as:

- business models;
- accreditation;
- development of the UK-specific platform, FutureLearn;
- implications for further education;
- completion and drop-out;
- the use of learning analytics;
- digital literacies and social models of networked learning.

Three policy recommendations are made: to push forward with the accreditation of MOOCs; to encourage innovation and transformation in continuing professional development (CPD) contexts, using MOOCs; and to acknowledge MOOCs as representing a significant shift to digital education by implementing policies which support and foster digital literacies (p.102). The report does not attempt a critical perspective, and it seeks to cover the MOOC phenomenon internationally, so some of the nuances that we have observed in our focus on the UK are not present; for example, the significant activity across a range of institutions, large and small; the existing interest and activity around accreditation; and the diversity of the pedagogical approaches being taken.

We now move on to a review of the MOOC literature, drawing out key themes which are emerging, and which relate specifically to the issues of concern in this report: pedagogy, course design, assessment, and the role of the teacher.

3. A review of the literature

Introduction

This section of the report is devoted to exploring the great diversity of approaches to MOOC pedagogy and design that are being described and commented on by educational researchers and subject specialists. This diversity is framed around five key and emerging issues for MOOC pedadogy:

- the troubling of the cMOOC/xMOOC binary;
- teacher role within MOOCs;
- tensions around MOOC learner participation;
- the meanings and implications of 'massive';
- tracing the boundaries between openness and control.

The review is based on an analysis of MOOC-related literature – peer-reviewed journal articles, book chapters, and conference papers – supported by a selection of some of the many blog posts, magazine and newspaper articles, tweets and images that have been describing and analysing the MOOC phenomenon. All the material included addresses some aspect of MOOC design, pedagogy, assessment and teaching. Excluded are the many papers and reports that are general introductions to the MOOC concept, or which have a primary focus on policy implications, business models, governance or purely technological issues; these have been well covered in other recent UK reports (Universities UK 2013; Yuan & Powell 2013; Haggard 2013). The emphasis here, and in the report as a whole, is on MOOC pedagogy and the impact of MOOCs on teachers and teaching.

The compilation of the scholarly literature began with our own substantial collection of accumulated material, and with the use of Google Scholar. Results from searches on 'MOOC' 'Massive Open Online Course' and related terms were supplemented by following up on references and using Google Scholar's reverse citation tool. In total, 103 scholarly papers were included in the review, with the vast majority of these having been published within the last year, including several recent special issues devoted to MOOCs. Not all of these 103 papers are cited in what follows; we have aimed primarily at ensuring mention of those which contain critical analysis and engaging observations about MOOC pedagogy.

MOOC research is still in its infancy, but a number of promising perspectives are emerging, and as a result the MOOC phenomenon is beginning to be better understood. What is most important, and a point that is repeated throughout this report, is that the concept of MOOC pedagogy, which has to date tended to be treated as a rather homogenous entity (for example, Glance et al., 2013), actually conceals a broad range of designs, approaches, and participant and teacher experiences. Veletsianos (2013) warns us to be sceptical of simplistic utopian and dystopian narratives of MOOCs, because:

> the reality of open online learning is that learners' experiences are neither as overwhelmingly positive as optimists make them out to be, nor as poor as critics suggest they are. (p.2)

For this reason, as Grover *et al.* (2013) put it, the question 'What makes a good MOOC?' needs to be reframed as 'How can we make a MOOC work for as many of its diverse participants as possible?' (p.1)

Beyond 'cMOOC' and 'xMOOC'

The most influential categorisation of MOOC pedagogy relates to the notion that there are two main kinds, each of which determines a particular pedagogical approach: the connectivist or 'cMOOC', driven by principles of pedagogic innovation within a richly networked, disaggregated mode of social learning; and the institutionally-focused 'xMOOC', characterised by a pedagogy short on social contact and overly reliant on video-lecture content and automated assessment. This categorisation has hardened into a binary which continues to offer a too-easy shorthand for describing MOOC provenance and pedagogy.

cMOOCs were the first massive open online courses, designed to test the principles of 'connectivism', working within a framework developed by Downes (2008) and Siemens (2005) to attempt to explain the nature of learning in highly networked environments. Early cMOOCs were designed to foster processes of 'aggregation, relation, creation, and sharing' (Kop 2011) among distributed groups communicating and collaborating online. cMOOC-type courses are structured to provide a minimum of centralised control or content, and to develop participants' ability to contribute to, and learn from, the digital network. Arguably, the 'massive' in these courses tends to refer mainly to the scale of the connections, content generation and participant activity in these courses, not their number of participants, which appears to be relatively low in comparison with first waves of xMOOCs.

The term xMOOC was coined to differentiate these cMOOCs from the newer, more massive, institutionally-driven and content-focused courses offered through platforms such as edX (from which the xMOOC gets its name), and Coursera (Downes 2012). xMOOCs are commonly described as being driven by 'behaviourist' principles of knowledge acquisition through repetition and testing (Rodriguez 2012). One argument for this approach is that it can scale up to cater for the numbers of people who sign up for these courses; typical enrolments reach 50,000, while the largest MOOC tracked in one study, Duke University's 'Think Again: How to Reason and Argue', had 226,652 enrolments (Jordan 2013). This scaling up is important to proponents of these larger MOOCs, who often frame their mission as being one of opening global access to education (Knox 2013b).

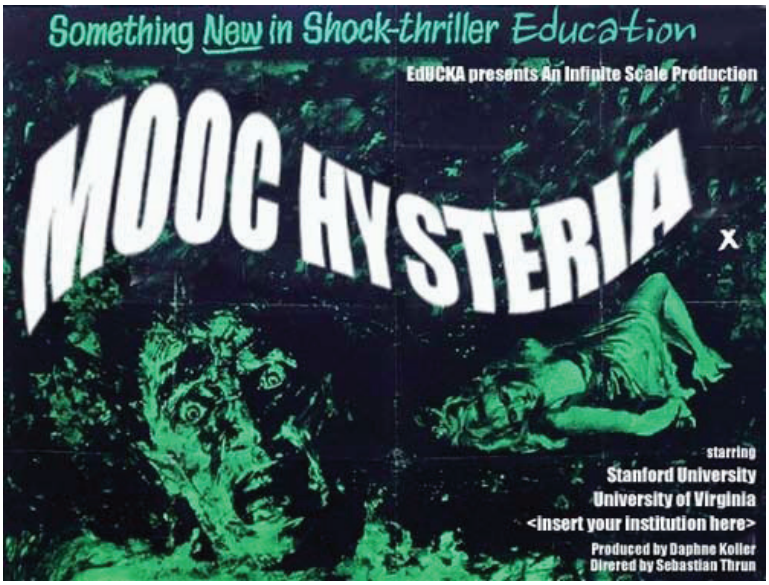

Figure 4: MOOC hysteria. © Cogdogblog 2012 sourced http://cogdogblog.com/2012/07/17/mooc-hysertia/ and reused under a Creative Commons Attribution Share Alike 3.0 Licence (CC BY-SA 3.0).

While the cMOOC/xMOOC binary is usefully descriptive of two different trajectories of development, and is much used by those espousing a connectivist perspective to criticise xMOOCs, recent literature is beginning to move away from what is increasingly seen as a simplistic categorisation, towards more nuanced and micro-level discussion of exactly what is going on in different kinds of MOOCs. This has led some commentators to propose new forms of categorisation (Lukeš 2012; Conole 2013; Lane 2012), and others to propose, for example, the notion of a 'hybrid MOOC' (Waite *et al.* 2013), or a process by which educators might 'mediat[e] the dichotomy between xMOOC and cMOOC' (Grünewald *et al.* 2013).

xMOOC pedagogy is rapidly evolving (Boyatt *et al.* 2014, p.138) and, as some researchers are beginning to note, what goes on in any given MOOC is no longer clearly determined by its 'x' or 'c' status. For example, Gillani's (2013) analysis of patterns of participation on a business strategy MOOC on the (xMOOC) Coursera platform found that most of the 4,337 discussion forum participants in the MOOC received below a 50% score on the MOOC, suggesting that 'most discussion forum participants are more interested in connecting with others to talk about issues with real-world significance and implications than they are in being formally recognized for their work.' (p.43) The presence of this group of students within the broader context of an 'xMOOC' indicates that the range of types of participation in MOOCs is not as simple as the cMOOC/xMOOC binary would suggest.

Neither are cMOOCs immune to these sorts of apparently contradictory participation patterns. Kop's (2011) analysis of two 2010 cMOOCs – including the Personal Learning Environments, Networks, and Knowledge (PLENK) MOOC run by key connectivist proponents Cormier, Siemens, Downes and Kop – found that while the course was explicitly designed to produce 'aggregation, relation, creation, and sharing' among participants, only a small minority of the 1,610 participants engaged in creation and distribution of digital artefacts (p.35).

The problem with over-simplistic categorisation of MOOCs is that it may do more than misrepresent what goes on in MOOCs: it may also shape and constrain future MOOC development in unhelpful ways. Clarà & Barberà's (2013) critique of connectivism from a psychological perspective urges new ways of considering MOOC pedagogy:

> recognizing... problems with the connectivist theory provides an insight into certain difficulties that learners experience in cMOOCs, difficulties that are not necessarily intrinsic to such pedagogical environments but rather a consequence of how learning in a MOOC is theoretically conceptualized... Although MOOCs were first launched by connectivists, connectivism is not intrinsic to MOOCs. (p.8)

What we are starting to see now is a move away from the cMOOC/xMOOC binary toward recognition of the multiplicity of MOOC designs, purposes, topics and teaching styles. Some teachers and organisations are rejecting the MOOC acronym altogether, in favour of 'DOCCs: Distributed Open Collaborative Course' (Jaschik 2013), 'POOCs: Participatory Open Online Course' (Daniels 2013), 'SPOCs: Small Private Online Course' (Hashmi 2013) and 'BOOCS: Big (or Boutique) Open Online Course' (Hickey 2013; Tattersall 2013). Teams and institutions are reframing and reshaping the MOOC and the massive for their own purposes – for collaborations (Scholz 2013), 'flipping' of classrooms (Bruff *et al.* 2013), and more.

The 'snapshots' section of this report illustrates some of the diversity of conceptualisations and designs that underpin MOOCs, and substantiate and extend Stewart's (2013) observation that not all MOOCs are the same: 'the distinctions individual university partners and teaching faculty may make regarding their given courses needs to be kept in mind when generalizing about MOOC models'. Each MOOC is profoundly shaped by its designers, teachers, platform and participants, as we will see. The binary terms 'cMOOC' and 'xMOOC', which are helpful in describing the lineage of MOOCs, are limited in their usefulness for those seeking to develop a MOOC, to understand how MOOCs are actually being experienced, or to draw conclusions about good practice in MOOC design and pedagogy.

Teachers and MOOCs

The role of the teacher in the MOOC has so far been under-examined. As the authors of a review of the MOOC literature to mid-2012 put it:

> most [MOOC] research has investigated the learner perspective, with a significant minor focus on the institutional threats and opportunities. The lack of published research on MOOC facilitators' experience and practices leaves a significant gap in the literature. (T. R. Liyanagunawardena et al. 2013)

To date, the complexities of teaching on MOOCs have been largely absent from debate, which typically describe only three forms of teacher – the distant 'rock star' or 'academic celebrity' lecturer, the co-participant or facilitator within a network, and the automated processes which serve as proxy tutor and assessor.

The 'academic celebrity' teacher tends to appear in discussions of early MOOCs on the big platforms such as Coursera – the 'xMOOCs'. This role is generally that of respected authority based in an elite institution; not available to MOOC participants in any dialogic or interpersonal way, but primarily through the recordings of their lectures. They take on the role of 'actor-producer' (Rodriguez 2012, p.7). Supplementing this role, 'the teacher' in these MOOCs is conceived of as a set of automated processes, such as automatically marked quizzes, algorithms for surfacing discussion posts that have been 'upvoted' or read by many participants, and programming tasks that either pass or fail according to whether they successfully run. In some MOOCs these processes are the primary or sole form of feedback to participants. For these reasons, the MOOC is described as being able to operate with 'minimal involvement' from the instructor (Rodriguez 2012, p.7).

This 'minimal involvement' position is also taken up by cMOOC theorists, from another angle. These express the goal of education as facilitating self-directed learning. Expansion of the personal network is considered of primary importance, not just as an 'amplification of learning,' but also as a way of overcoming the limited number of teachers (Siemens 2005). Teaching is framed as a supporting device for performing learning processes. Discussions of teaching in connectivist literature often describe a horizontal 'power-free' domain of participation and sharing. McAuley *et al.* (2010), for example, while acknowledging the 'negotiations of power in which people establish the right to speak and be heard based on relational roles' (p.21), claim the cMOOC to be 'an open and a-hierarchical invitation to participate in and scaffold activities and discussions' (p.11).

In both cases, the individual MOOC as a 'designed object' (Grover *et al.* 2013) is often not discussed at all, let alone in terms of the philosophies, disciplinary context or choices of a teacher. The pedagogy of the MOOC is commonly held to reside in the platform itself (Knox 2013b). Audsley *et al.* (2013), for instance, describe the 'effective learning methods' built into the design of Coursera (and presumably therefore instantiated in every course taught on the platform) in the following terms:

> Striving to make the platform distinct from other types of MOOCs, the Coursera team sought out sound pedagogy on effective learning methods and then translated the concepts into processes that could be built into the design of the platform itself. (p.138)

Indeed, Coursera's site describes its pedagogical foundations in some detail, often conflating course design with platform design, for example: 'a key factor in the design of the Coursera system is the extensive use of interactive exercises' (Coursera n.d.). As Feldstein (2012) has put it, what is missing from this account is 'you know... teaching'.

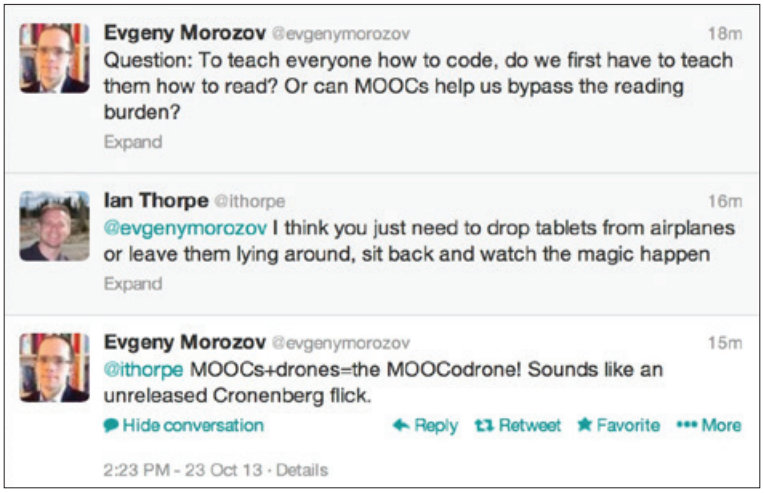

Figure 5: MOOCodrone? Courtesy of Twitter.

However, research examining specific MOOC contexts is beginning to call into question the minimal involvement position (Ross *et al.* 2014), in the same way as is happening with the cMOOC/xMOOC distinction. Notions of teacher presence and activity now begin to appear, though they may be framed in terms of concepts like facilitation:

> This research showed the importance of making connections between learners and fellow-learners and between learners and facilitators. Meaningful learning occurs if social and teaching presence forms the basis of design, facilitation, and direction of cognitive processes for the realization of personally meaningful and educationally worthwhile learning outcomes. (Kop et al. 2011)

Waite *et al.* (2013) describe a process in their MOOC whereby participants move from being overwhelmed by the volume of content and conversation, to being selective about their engagement, but they identify a need for more 'scaffolding' to support this. Mackness *et al.*, analysing the first cMOOC, CK08, describe a necessary role within the MOOC in terms that evoke that of an experienced and skilled teacher, involving a combination of 'light touch moderation', 'firm intervention', and 'explicit communication of what is unacceptable', carefully balanced to the needs of a 'complex, open course, rich in emergence, [which is] not defined by what must happen, but rather by what must not happen' (Mackness *et al.* 2010).

Likewise, there is nothing 'minimal' about the ambitions that some describe for the MOOC, and it is difficult to see how the teacher can be constructed as anything other than an active agent in these experiments:

> [MOOCs can] be seen as resources by which institutions can test the delivery models and pedagogies of competitors and themselves, develop new teaching and learning models, and force us to more seriously examine our models and methods of accreditation. (Anderson 2013)

Teachers we spoke to for this report described their approaches to, and reasons for, making a MOOC in a wide range of ways. These included experimenting with scale and complexity; sharing expertise; growing or establishing the profile of their subject area, institution, or individual reputation; making education more accessible; and developing new networks. For these and other reasons, all of these teachers described their engagement with their MOOCs as substantially time-consuming as well as being intellectually and emotionally significant. We predict that the absence of the teacher in the MOOC literature will begin to be remedied as more concrete examples of MOOC practice are analysed and discussed.

Tensions around participation

If the teacher's role has had relatively little attention paid to it, the participant's role is hotly contested across almost all literature and debate about MOOCs. Indeed, the key dilemmas in MOOCs centre on what participation actually *means*, how it should be measured, and consequently, what metrics of success and quality are appropriate for these courses. These concerns have led to a proliferation of models of participation, including Clow's (2013) 'funnel of participation'; Kizilcec *et al.*'s (2013) four engagement patterns of completing, auditing, disengaging and sampling (p.3); Hill's (2013) five archetypes of no-shows, observers, drop-ins, passive participants and active participants; Mak *et al.*'s (2010) dimensions of movement between MOOC environments; and Milligan *et al.*'s (2013) continuum of 'active', 'lurking' and 'passive' participation.

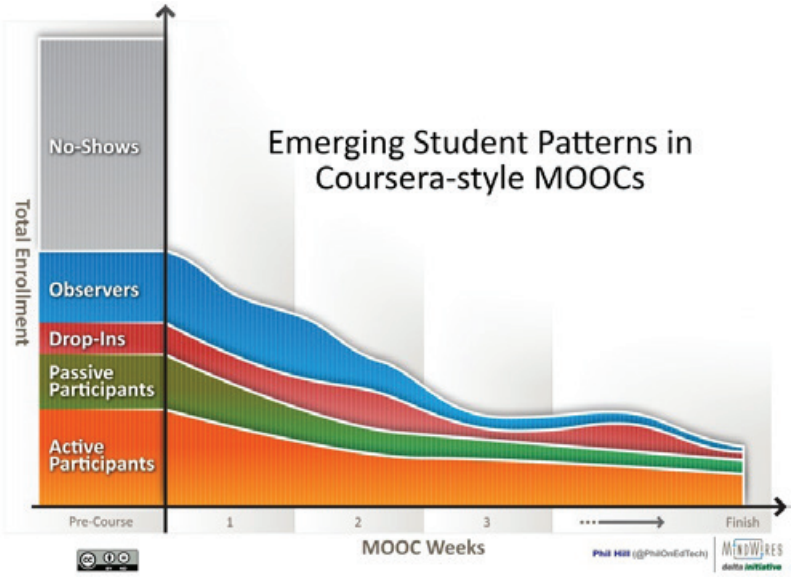

Figure 6: Hill's (2013) visualisation of emerging student patterns. © Phil Hill, 2013 reused under a Creative Commons Attribution no-derivatives licence.

Part of this complexity seems to arise because there are simply so many people, doing so many different sorts of things in any given MOOC, that actual practice has to be seen as 'nuanced, strategic, dynamic and contextual' (Mak *et al.* 2010, p.280). This presents a challenge for researchers, educators and institutions accustomed to using 'completion' as a fairly stable measure of the success and quality of an educational offering. Formal completion rates (for MOOCs that can measure these), which rarely rise above 10% (Jordan 2013), are increasingly thought not to be the right way to judge the quality of a MOOC or of participants' experiences. The 'outsized media attention' this statistic invariably receives is not taking sufficient account of those who may be engaging but 'do not adhere to traditional expectations, centered around regular assessment and culminating in a certificate of completion' (Kizilcec *et al.* 2013, p.9). For example, in a 'Writing in the Sciences' MOOC, where participants were asked before the start of a MOOC what their intentions were with regard to the course, completion rates could be seen to be highly differentiated. For those who stated in the pre-course survey that they *intended to complete* the MOOC, completion rates were 24%. For the remaining course population, just 2% formally completed the MOOC (Koller *et al.* 2013).

The notion that people might sign up for a course not intending to complete the assessments is one that is unfamiliar to fee-charging institutions, but it is extremely common in free courses where the barrier to entry is usually as low as clicking a registration button and entering an email address. In such a context, new measures of success and quality are required, because participant behaviours and intentions are so diverse.

As an example of this diversity, the use of discussion forums among MOOC participants – another measure often used to assess MOOC activity and 'success' – can vary widely according to context. In instances where MOOCs are serving as resources for a face-to-face class, forums are used very little, or not at all, by participants (Bruff *et al.* 2013; Caulfield *et al.* 2013). Researchers analysing a MOOC about circuits and electronics found that those who completed the MOOC and earned a certificate 'used the forum at a much higher rate than other students' (Breslow & Pritchard 2013, p.22), but Gillani (2013) found the opposite in a business strategy MOOC: that many participants used forums in preference to the formal work of the course.

While presenting researchers with challenges to their assumptions about participation and how to study it (Koutropoulos *et al.* 2012), Stewart (2013) proposes that this diversity, and the relative freedom to come and go in a MOOC, can be seen as a strength of the format:

> In all MOOCs that enable voluntary, open, free registration, learners set some of their own terms for participation in a way that differs from conventional higher education offerings. The fact that a learner need not qualify nor complete a MOOC in order to be considered a legitimate student within that course creates a very different relationship to course requirements and to the instructor, and alters learners' agency over the terms of their experiences. This decentered, fluid notion of what a course is corresponds with the participatory ethos outlined by Lankshear and Knobel (2007).

However, in MOOCs with a connectivist ethos, some forms of participation can be unwelcome. Rather than anxieties about 'completion', which tends not to carry so much significance in these courses (they are rarely formally assessed), in cMOOCs tensions around 'lurking' are pronounced. The idea that people are present, but not actively contributing material to the MOOC, threatens the premise of the cMOOC, which relies on the network to produce, not just to consume, content. Lurking is seen at one extreme to represent a need for more support for participants who may lack confidence (Kop & Carroll 2011), and at the other to be irresponsible and not in the spirit of the MOOC. Arguably, neither of these positions paints the whole picture. The fact that such lurking persists, and at extremely high levels, in cMOOCs has led several authors to suggest that it presents a challenge to the theory of connectivism itself (Bell 2010), while others believe that connectivism can take better account of lurking, while remaining a viable framework (Tschofen & Mackness 2012).

Questions around participation are key in the MOOC research landscape. One set of methods that is seen as useful in achieving a better understanding of MOOC participation is in the emerging domain of learning analytics (Ferguson 2012). The massive data sets that many MOOC platforms generate mean that complex patterns of MOOC participation can be examined, visualised, analysed and discussed in detailed and potentially very fruitful ways. It is still too early to be sure how helpful learning analytics will be, and the critical implications of the learning analytic approach are only beginning to be addressed, but they seem to be poised to generate fresh insights into retention, informal learning, feedback and teaching online at massive scale. Indeed, such insights might be relevant in a range of teaching contexts (Scholz 2013). If the necessary critical questions are asked about what can and should be measured by learning analytics (Deimann & Farrow 2013, p.355), they may prove to hold considerable promise for MOOC research and development.

The meaning of the massive

The rise of the MOOC has created a new energy around debates about the value of online education, as both critics and enthusiasts envision futures where MOOCs and online education are synonymous (Deneen 2013; Shirky 2012). However, leaving aside the more hyperbolic accounts of the future of learning, the online nature of the MOOC is not what is fundamentally new or innovative about it. Rather, 'it is the 'M' in MOOCs that underlies and influences the unique nature of the design space' (Grover *et al.* 2013, p.1).

The scale of the MOOC, and what this means for teaching and learning, is being discussed in a range of ways. Some authors express great reservations about whether a MOOC could ever be right for institutions and teachers who are committed to interaction and contact:

> The massive scale of xMOOCs limits the amount and type of interaction between faculty and students. The mentorship and detailed feedback that is emblematic of the [American 'liberal arts college'] experience is impossible with more than a few dozen students at a time. (Scholz 2013)

Indeed, as we have already seen, massiveness represents a profound challenge to the nature of the teacher's role:

> The larger the MOOC... the more it destabilizes the centrality of the teacher's role within the course. ...at massive scale, that relationship cannot be expected to be directly reciprocal. Even where a MOOC instructor centers a course on his or her expertise, the scale of the class violates the convention of personal focus and contact between teacher and student. In MOOCs with 20,000 or even 2,000 students, teachers cannot humanly assess and validate the mastery of those learners. (Stewart 2013)

On the flip side, MOOCs always lose the majority of their initial enrolees no matter what support is in place, because many people's investment in a free course, especially one that is demanding in terms of time or effort, is not sufficient for them to persist with (or even start) their studies. Where the course was not all *that* massive to begin with, as we will see in our snapshots, this can result in what started as a MOOC becoming more like a traditional online course. This likelihood becomes greater when courses are offered which are specialist or niche and therefore have naturally small audiences; are advanced and require particular backgrounds, skills or knowledge (Audsley *et al.* 2013); or are offered in less-spoken languages (Romero & Usart 2013). In these cases, what may be 'massive' is the potential of these courses to reach and engage their audiences wherever those audiences may be: to capture some of the 'long tail' of language proficiency or subject interest or need. This is massiveness as proliferation, and it seems to offer potential, for example, for valued courses which might struggle to be viable in a face-to-face context. It can also be useful as a critical response to the suggestion that MOOCs might result in fewer, rather than more, perspectives being available as knowledge of a given topic is consolidated and frozen into a single MOOC from an 'elite' professor – probably in a Western institution (Rhoads *et al.* 2013).

Figure 7: 'Freeze the present' courtesy of Twitter and with permission from Gerry Canavan.

As Portmess (2013) notes, the language used by the big MOOC platform providers, which offer the 'best courses' and 'best professors', 'hardly conceals an assumed claim for superiority of knowledge and a model of education ready for export without concern for cultural boundary distortions' (p.3). These claims extend to serious mischaracterisations of the world beyond the US, as Beasley-Murray (2013) has recently pointed out.

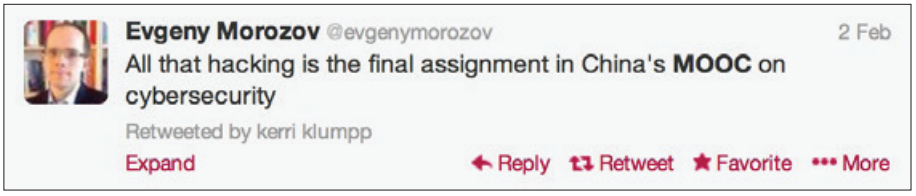

Figure 8: 'All that hacking....' courtesy of Twitter.

Proliferation may help to counter the notion of openness as 'unrestricted access to information' that nevertheless keeps the production of that information firmly out of sight and reach (Knox 2013b, p.25). It is to this, and other ideas of openness, that we turn now.

Openness and control: tracing the boundaries

Having discussed the 'M' in MOOC, we attend in this final section to one of the Os: 'open'. Some of the most profoundly paradoxical claims about MOOCs involve tensions around institutional, corporate and user control, open and free access, and innovation and quality assurance. As with other aspects of MOOCs we have discussed so far, there is no single best practice to draw on to resolve these tensions.

One area of great interest and active experimentation in MOOCs involves assessment. Where it is possible to assess individual work robustly in a MOOC, other things can follow: the ability to measure whether learning takes place in a MOOC, and how this compares with learning in other contexts; the accreditation of MOOCs by higher education institutions; the monetisation of MOOCs by platform providers, universities and perhaps other organisations. However, there are a great number of questions to resolve, including:

- How should individuals be authenticated so that the correct person's work is being assessed?
- What sorts of learning can be assessed at scale?
- How can cheating be prevented in massive online courses?
- Who should decide how much university credit a MOOC is worth?
- Who should bear the cost of credentialing MOOCs?

What becomes immediately evident from the list of questions, apart from the difficulty of answering them, is that the 'openness' of a MOOC has a very different future in a system of accreditation than it does in informal learning settings. It is essential to consider these questions not only in terms of the considerable practical and technological demands they present, but also critically, for example to address:

> the complex and urgent question of how the academic significance or market value of these credentials will be measured and understood. It is one thing to bring educational content and credentialing data to the celebrated speed and ubiquity of the Internet; it is another to establish fruitful connections with systems of economic value and social capital - systems predicated on economies of scarcity and lack rather than instantaneity and plenitude. (Friesen & Wihak 2013, p.52)

MOOC researchers are beginning to explore some of these questions from a number of angles, including how formative and summative feedback can be generated (Whitelock *et al.* 2013); how automated and peer assessment might make essay-based assignments possible (Balfour 2013); how cheating can be prevented (Meyer & Zhu 2013); how MOOCs can be used as 'entrance exams' (Vihavainen *et al.* 2013) or as foundational learning (Wartell 2012) for traditional degree programmes; and how credit from a MOOC can be awarded, directly or indirectly (Bellum 2013; Bruff *et al.* 2013).

Complex barriers to openness come into play in the large MOOC platforms such as Coursera, whose default terms and conditions restrict reuse, modification or redistribution of course content (Yeager *et al.* 2013). These terms can be negotiated, but where these restrictions are in place, as Liyanagunawardena *et al.* (2013) point out, they may be particularly off-putting for participants from developing countries:

> For higher education policymakers, administrators and educators in the developing world while (used judiciously) [Open Educational Resources] might offer them a basis for more cheaply developing their own fit-for-purpose (socially, culturally, and targetted to the needs and abilities of their learners) higher education systems, MOOCs may offer their learners a take-it-or-leave-it (Adams 2013) colonial educational experience dependent on technologies only available to the already-privileged in those countries. (p.5)

This is one of several reasons the authors identify for the 'very limited participation [in MOOCs] from Asia and even less from Africa' (p.2). It also draws attention to the need to be clear about the definitions of 'openness' that are being deployed in any given MOOC context – the free software movement's distinction between 'gratis' (free of charge) and 'libre' (without restriction) is one helpful way of doing this (Lessig 2006).

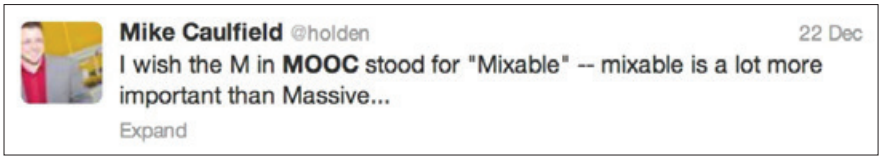

Figure 9: 'M in MOOC' courtesy of Twitter and with permission from Mike Caulfield.

Like the massive, testing the boundaries of openness produces energy, ideas and insights that are pushing MOOCs forward into new territory. De Waard *et al.* (2011) have proposed the concept of complexity as a useful framing mechanism for community-driven MOOCs 'that allow learners to build knowledge by filtering that complexity', and are optimistic about the opportunities such a frame might generate. Elsewhere, MOOCs are seen, justifiably, as a promising space for experiments. Examples can be found in citizen science (Neuroscience for the People 2013), problem solving (Russell *et al.* 2013), supporting peer assessment (O'Toole 2013), recognising achievement (Moore 2013), open educational resources (Knight 2013), new forms of participation and engagement (Purser *et al.* 2013), and developing digital literacies (Stewart 2013), among others.

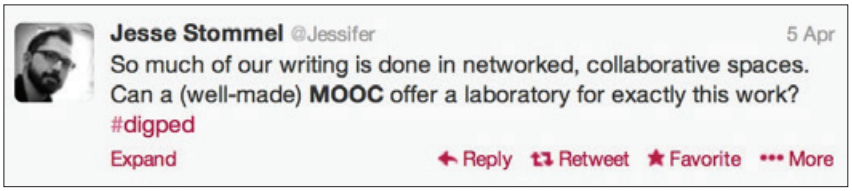

Figure 10: 'A well-made MOOC' courtesy of Twitter and with permission from Jesse Stommel.

The tremendous energy that such experiments can produce, and the successes and insights they are generating, are reflected on and celebrated in this report. At the same time, the pressure that teachers and course developers can feel to ensure that their experiments reflect well on their institutions, and the sometimes very public consequences of mis-steps or accidents (Oremus 2013), also need to be carefully considered.

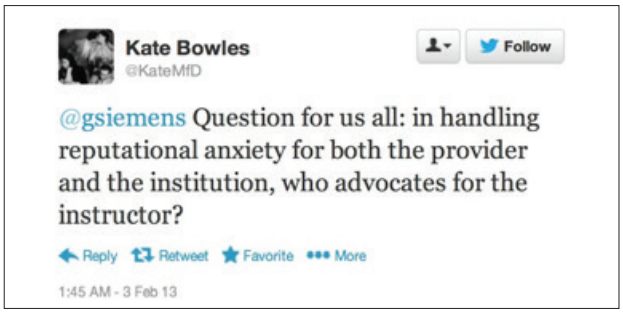

Figure 11: 'Who advocates for the instructor?' courtesy of Twitter and with permission from Kate Bowles.

Openness, as with all the issues raised in this review, brings both blessings and curses, and teachers are experiencing both.

4. UK MOOC pedagogy: snapshots

This section of the report provides a snapshot of five UK MOOCs, with a focus on the practices and priorities of the academic teaching colleagues involved in their design and delivery. The MOOCs discussed here are:

1 Vampire Fictions: a for-credit MOOC offered by Edge Hill University and taught by Dr Benjamin Brabon.

2 Artificial Intelligence Planning: one of the first UK Coursera MOOCs offered by the University of Edinburgh, and taught by Dr Gerhard Wickler and Professor Austin Tate.

3 Open Learning Design Studio's MOOC (OLDSMOOC): led by the Open University with several UK partners and a large team of teaching colleagues led by Dr Yishay Mor.

4 First Steps in Learning and Teaching: the first UK MOOC to identify itself as such, offered by Oxford Brookes University and led by Dr George Roberts, Marion Waite, Elizabeth Lovegrove and Jenny Mackness.

5 Web Science – how the web is changing the world: one of the first wave of FutureLearn MOOCs offered by the University of Southampton and led by Professor Les Carr and Professor Susan Halford.[2]

The aim of this section is to fill a gap in existing MOOC literatures by looking in some detail at teaching practices, understandings of MOOC pedagogy, and the impact of these on teachers who are actively involved in their delivery. Each snapshot is informed by an interview with one or more of the MOOC leads, accompanied by an interrogation of any existing literatures surrounding the MOOC, an analysis of its structure, and an attempt to relate teachers' pedagogical approaches both to platform and institutional contexts for the MOOC's delivery.

2 Further HEA-commissioned research into learner experiences of the MOOC, based on a detailed investigation of the Web Science MOOC, will be published in 2014.

Vampire Fictions and the pedagogy of the undead

Figure 12: Vampire defined in antique dictionary © catscandotcom 2008, purchased from www.istockphoto.com/stock-photo-5589827-vampire-defined-in-antique-dictionary.php

Basics

Institution	Edge Hill University
Course lead	Dr Ben Brabon
Start date	3 September 2013
Length	12 weeks
Platform	Blackboard CourseSites and Collaborate
Enrolments	c.1000
'Completions'	31 active at time of writing, half-way through the course
Structure	Weekly readings; weekly video lectures; course discussion forum; weekly one-hour live classroom
Assessment	10 minute podcast presentation; 1500 word critical blog and 300 word peer blog commentary
Credit status	FHEQ level 4, 20 credits
Website	http://www.edgehill.ac.uk/english/courses/vampire-fictions/
Further reading	Vampire Fictions module handbook: http://www.edgehill.ac.uk/english/files/2013/04/MOC1001-Vampire-Fictions-Module-Handbook-2013.pdf

The 'Vampire Fictions' MOOC is interesting for our purposes in that it is only the second UK MOOC to offer credit (the first being 'First Steps into Learning and Teaching in Higher Education' offered by Oxford Brookes), and is offered without partnership with a MOOC provider. It is currently the only institutional MOOC offer from Edge Hill University. While designed with the collaborative, social intent of the

'cMOOC' in mind, it is delivered in a relatively structured and content-driven form through the CourseSites platform.

Openness and containment

This MOOC has a particularly interesting genesis, in that it was conceived from the enthusiasm of an individual academic and his students, and then – partly because of the decision to offer it as a credit-bearing course – subjected to very robust institutional validation processes which, in pursuing the quality agenda, may have functioned to alter some of its original pedagogic intent. According to the course lead, Dr Ben Brabon, the course was, at least partly, student-initiated:

> In part it developed out of my on-campus version of vampire fictions and we had a lot of discussion with the student cohort: how, why should this end? Shouldn't we share this with other people?

However there was a strong desire within the institution to 'do this properly', a sense that:

> we should validate it to make sure the right mechanisms are in place... as if it is another course of equal weighting and value to something delivered on campus.

Thus the course seems at least in part defined by a negotiation of the boundary between openness and control: a desire to offer on an open basis, balanced by a desire for institutional containment and the need to protect institutional reputation. The balance between these two factors permeates the pedagogic approach and media mix which drives the course:

> The institution is very keen to keep everything contained... I've tried to encourage students to post externally to [CourseSites] – I'm trying desperately to move away from CourseSites but being aware that with a validated module that's got an institutional stamp on it... There are elements of social media but I'm still mindful of when you have a validated entity there needs to be a consistency of provision. We didn't want to let this run away from us. There is an element of control there.

With active participation at the time of writing (week 5) being only around 3% of initial enrolments, the course has had relatively high drop off. Dr Brabon ascribes the 'literal disappearance' of the participants to the niche nature of the subject matter, and to its credit-bearing status, each of which have played a role in 'whittling people down'. As with several of the MOOCs we looked at which started with relatively low numbers, the MOOC has lost its 'massive': 'I'd say it's far more a SPOC [small private online course] than a MOOC now'.

Where most MOOC lead academics were able to comment on the personal and emotional impact of delivering their MOOC, in this instance the prime challenge for the course lead was not course delivery, but course validation and the sense in which by offering this course for institutional approval, and driving this form of institutional change, the individual academic involved was working with some reputational risk.

This is something apparently common across the first wave of UK MOOCs: that MOOC leads were shouldering a fairly heavy burden in terms of driving institutional and sector-wide change, and that while this was rewarding, it could also be a unique challenge for individual academics.

Figure 13: Wordcloud generated from interview transcript: concerns with validation, institution and credit dominated discussion of a course which was driven and determined by its credit-bearing status. © Tagxedo (http://www.tagxedo.com) and reused under a Creative Commons Attribution-Non commercial-ShareAlike License 3.0.

A pedagogy of the undead

The Vampire Fictions course seems to have been characterised by forms of haunting. Most notably, this applies to the course design, which Dr Brabon describes as being driven by a 'connectivist' intent, but, ultimately was informed by more instructivist and outcomes-driven 'xMOOC' characteristics. He felt that there was 'a sense of haunting, at every level, from the platform through to delivery'. The MOOC design was a kind of 'hybrid', a 'cMOOC' haunted by the 'xMOOC' form:

> When it comes to credit and quality I think there really is a point where an xMOOC pedagogy comes back in, intervenes, almost pricks the surface, punctures the surface... If you open something completely up how do you guarantee that that self-regulated, open approach meets those learning outcomes, hits the benchmark statements?

The haunting of this MOOC was also played out here in the sense that the MOOC ethos and pedagogy was tightly influenced by its subject matter, and by Dr Brabon's passion for his subject specialism. The Gothic is the 'point of inspiration' for the teaching strategy of the course: 'As a genre it encourages us to explore our personal fears, anxieties and traumas, through monsters, through vampires.' This subject-informed take on pedagogy, based in individuals' passion for their disciplines, was common across the MOOCs we looked at, and gave a far more interesting inflection to the question of MOOC course design than the identification with 'social constructionism', 'connectivism', 'xMOOC' or 'cMOOC' which tends to focus discussion in the literature. Here, it led to an understanding of a pedagogy very specific to this particular MOOC and the intellectual orientations of its teacher, as the following sections demonstrate:

> Teaching the undead is a very useful pedagogical strategy, because it pervades different areas of understanding from the medical sciences through to literature, so I think there is something there in terms of its capacity to cross boundaries, to engage the imagination. We all have particular fears, traumas. Teaching the undead – I think there is tremendous scope there.

A teacher who exists

This subject specificity informed Dr Brabon's perception of his own role as MOOC teacher in that he emphasised his desire not to be there as a 'celebrity academic' but 'as an individual who has a shared enjoyment of vampire fiction: that was key to my thinking about the role of the tutor'. Perhaps another kind of dialogue with the notion of haunting was present in the way in which he emphasises the need to be a 'live' teacher, a teacher that 'exists' and is 'visible': the 'live' classroom sessions in Collaborate became a key element of the teaching strategy in this sense:

> The live class time has been a big discussion point because that, for many of them, has been something different, to actually be able to see me, to actually be in class from time to time, and talk around the point with someone who actually exists in that way.

Perhaps in this emphasis on his own visibility it is unsurprising the MOOC has been characterised by a movement away from social media and the CourseSites platform toward more apparently immediate tutor contact: there has been a 'complete migration away from CourseSites [towards] email'. Although the amount of tutor time given to the course – at approximately four hours per week – is comparable to on-campus equivalents, most of this time is spent in one-to-one email contact with individual course participants:

> I would say that my time isn't spent on CourseSites, it's corresponding with students in other forms. I've been surprised how many students will email me. Even students who don't share in discussion, will strike up conversations with me by email... Beyond that hour when we're in class, in the Collaborate session, it's been email, it's been email all the time.

Activity on the discussion board of the MOOC is indeed low, with only about 130 posts in total present by week 5. However, email activity is likely to be as much influenced by the CourseSites interface, which in this configuration offers easy email access to discussion post authors, as it is to the tutor's own commitment to visibility. Again, how pedagogy is performed here is a question of a coming-together of tutor intent and the design of the platform: it is not possible to see the two as anything but tightly connected.

What it means to be a teacher, in this MOOC, is closely linked to what it means to be an academic and a passionately enthusiastic subject specialist. A desire for connection, and to inspire and inform collective thinking within a particular subject area here drives the performance of the MOOC teacher:

> In terms of me personally, and my institutional context, I certainly am not aiming for celebrity status or a particular brand identity that academics at big research intensive institutions in the UK or the States already have in place. I think that for me it was more about connecting, connecting with people beyond the walls of the institution, that actually would have common interest and common enjoyment around the reading of vampire and gothic fictions. That I could join into discussion, to inspire and change how we think about this form of fiction. And that was my ambition... It was more to do with what I'm doing, than with who I am.

Artificial Intelligence Planning: troubling the xMOOC

Figure 14: © University of Edinburgh 2013, reused under a Creative Commons Attribution licence.

Basics

Institution	The University of Edinburgh
Course lead	Dr Gerhard Wickler and Prof Austin Tate
Start date	28 January 2013
Length	Five weeks
Platform	Coursera and Second Life
Enrolments	29,894
'Completions'	3,664 remained active to the final week. 743 completed the final assignment. 652 achieved a statement of accomplishment
Structure	Video lectures each week, optional feature videos and supplementary materials. Course discussion forum and Second Life classes. Three levels of learning attainment acknowledged: statement of accomplishment issued for awareness level, foundation level, or performance level attainment
Assessment	Mid and end of course quizzes, 'creative challenge' digital artefact creation and programming assignments
Credit status	No credit. Delivered at SCQF level 11 (Masters)
Website	https://www.coursera.org/course/aiplan
Further reading	MOOCs@Edinburgh (2013) Report #1: https://www.era.lib.ed.ac.uk/handle/1842/6683 AI Planning MOOC statistics: http://blog.inf.ed.ac.uk/atate/2013/03/12/coursera-ai-planning-mooc-statistics/

The Artificial Intelligence (AI) Planning MOOC is included here as one of the first-wave 'xMOOCs' delivered from the UK, via the University of Edinburgh partnership with the US MOOC platform Coursera. As an early UK MOOC on an 'xMOOC' platform – in the disciplinary area of computing science, a dominant field within xMOOC provision – this MSc-level MOOC is particularly interesting because of the way it balances the content-focus of conventional 'xMOOCs' with a commitment to community-building, and for its innovative approach to the inclusion of attainment levels within the MOOC design.

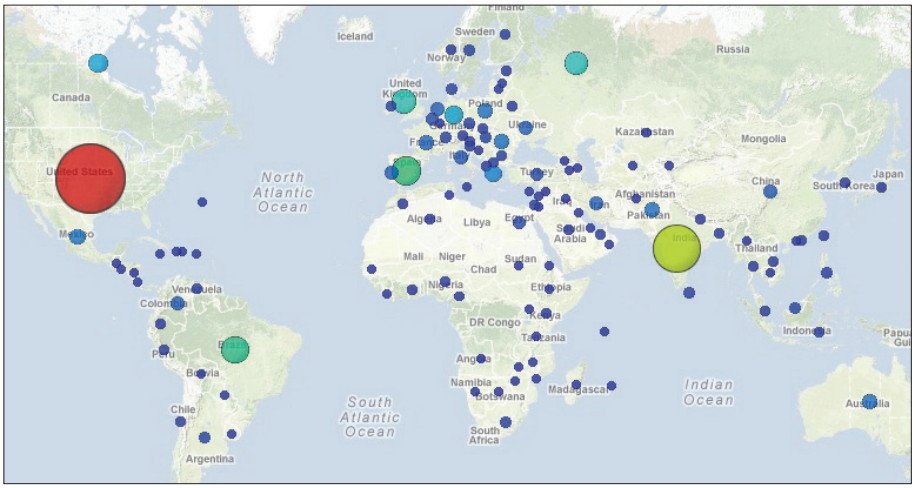

Figure 15: Participant location on the AI Planning MOOC, 11 February 2013 based on a sample of 3,335. © University of Edinburgh 2013, reused under a Creative Commons Attribution licence.

Troubling the xMOOC

This course which, given its discipline area and platform, might have been expected to adopt a content-focused approach to design, and a focus on programming skills, was actually driven equally by a desire on the part of the developing team to open up the field of AI Planning to new communities and groupings beyond computing science. In this sense the MOOC design was as much driven by a process- and community-focused ethos as it was by the desire to offer quality teaching content.

Interestingly, part of the motivation for developing this MOOC was a desire on the part of the course team to make a body of rare materials readily available online as part of a legacy approach to a niche collection of teaching material. Professor Austin Tate explained that:

> We have a lot of [teaching] materials for occasional use. We were already thinking about how to package that better, particularly as I come to retirement age. We want the materials to be available as a basis for future PhD and MSc student projects. And some material we've got that we didn't want to lose, in particular we've got materials that even some of the originators haven't got any more and we wanted to try and make sure some of that was brought together. So that's the motivation – packaging it well for others to make use of, and the broader we can disseminate that the better.

This teaching material is technical content that has been held by the School of Informatics at the University of Edinburgh for some time, collected over a long period and used occasionally in the teaching of conventional classes, but not until now made widely available online. These materials and their proper care were core to the design ethos of the MOOC.

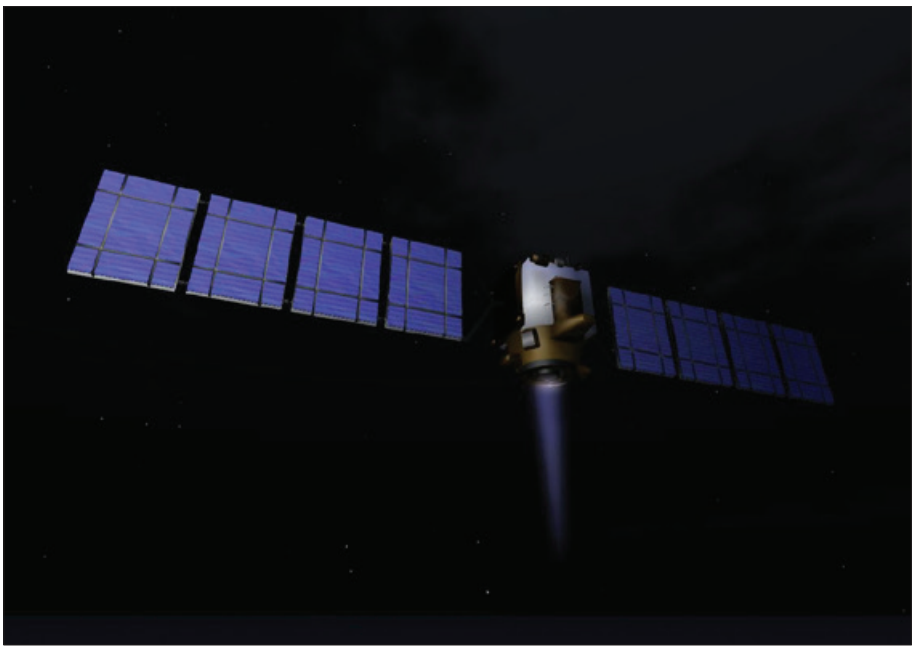

Figure 16: 3D model of NASA's Deep Space 1: the first spacecraft to be controlled by an onboard AI planner, Virtual World Image by Austin Tate. © University of Edinburgh 2013, reused under a Creative Commons Attribution licence.

However, while one driver for the MOOC design was a desire to make available these materials as legacy, an equally strong one was the desire to build and extend a community, as Professor Tate explained:

> The whole framework of it was definitely conceived as, and run as, a community of people interested in a common topic, and working together and exploring that space together. I was trying to reach different communities, and not just those interested in programming.

In part, this was approached by a course design that made success on the course achievable by non-programmers. Participants were able to gain 'Statements of Accomplishment' for achieving one of three levels of successful participation:

- awareness level (aimed at those who were approaching the course as a 'taster' or a very broad introduction to the subject matter – 352 people passed at this level);
- foundation level (for those who had fully grasped the core course content – 148 passed at this level);
- performance level (for those who had taken their understanding of course content to a more advanced level by completing programming assignments or the creation of a digital artefact – 152 passed at this level) (Tate 2013).

This MOOC did important work therefore in opening up alternative ways of thinking about MOOC 'completion', and in doing so worked to broaden its own community of learners. For example, two science fiction authors took the course at awareness level as a means of achieving a richer subject-knowledge in their literary area.

This opening of community was also approached by bringing in guest feature lectures from eminent international figures in artificial intelligence research, and then inviting these guests to interact with students within the MOOC discussion space. The MOOC space in this sense became a richly curated expression of the development team's research networks, rare materials collections and a teaching ethos described by Professor Tate as inherently collaborative:

I like projects, I like things where you pull a lot of things together, I like multi-person things... The bits I was doing on this course... the way we pulled people in, I think that reflects my interest in collaborative, joint things – doing things together. ... I'm not so keen on people going away and doing exercises, beating their head against the screen all on their own.

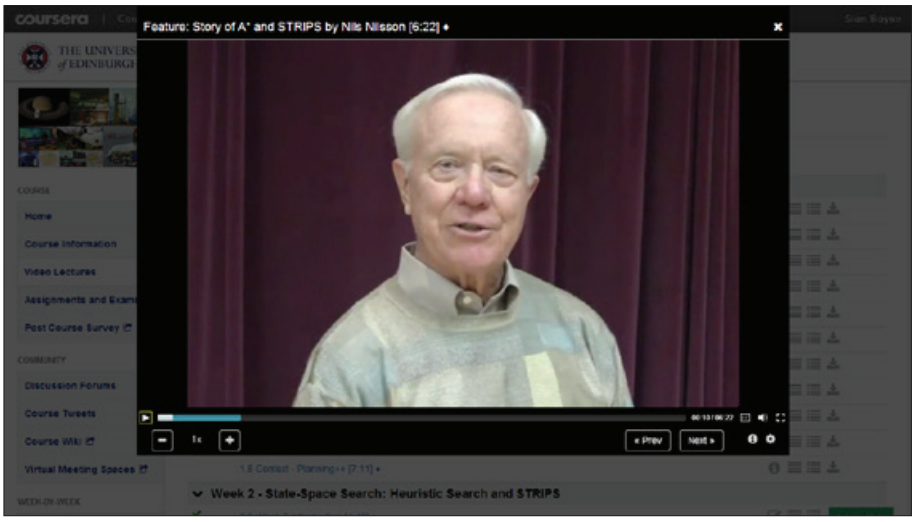

Figure 17: A guest lecture from Nils Nilsson: founding figure in AI research and Stanford professor. © University of Edinburgh 2013, available via http://www.youtube.com/watch?v=mQ7M-zhiu7U and reused under a Creative Commons Attribution licence.

The AI Planning MOOC also included use of a virtual world platform, Second Life, for meetings between instructors, community teaching assistants, feature lecturers and students. Weekly events were run chaired by a student within the community, and set to different time zones to encourage participation.

Figure 18: AI Planning MOOC class meeting in Second Life, with a student discussing their 'Creative Challenge' digital artefact on AI Planning in healthcare. © Linden Research Inc, 2013.

However it is notable that despite the strong and explicitly-stated commitment to community and collaboration held by the teaching team, levels of discussion and interaction on the MOOC appear to have been low: only 4% of active participants contributed to the discussion forum (Edinburgh 2013) and participation in the virtual world meeting space involved only a few people, as can be seen in the image. Even assuming that some participants were engaging in other media beyond the boundaries of Coursera, the figure indicates that there were high numbers of students engaging in the course primarily via consumption of content and completion of the automatically-marked quizzes.

One reason for this, perhaps, is that the perceived 'norm' of 'xMOOC' engagement as lecture consumption and automated quiz or programming assignment completion was established within early courses dedicated to computing science, and that this is a mode which is both expected and found to be relatively effective within the disciplinary contexts of informatics and engineering. Many students would have enrolled on the course with this expectation. Indeed the low levels of discussion activity do not correlate either to levels of teacher input, which was high (see below), or to participants' overall satisfaction with the course (on the contrary, in the course evaluation survey (Tate 2013) 93% of respondents found the course excellent, very good, or good).

Further, the Coursera platform (along with Udacity) was originally developed by computing scientists, on the basis of the highly successful early MOOCs offered by Stanford University in Machine Learning, Introduction to Artificial Intelligence, and Introduction to Databases. While this disciplinary orientation of the platform is shifting as MOOCs in the Humanities and Social Sciences become more common, it is not unreasonable to suggest that the platform itself still embodies, to an extent, a pedagogical ethos which works well for certain disciplines and teaching philosophies, and less well for others. Thus the social, collaborative intention of the AI Planning MOOC – while impressive – was perhaps working against both disciplinary expectation and the driving platform dynamic, which in the end were the dominant factors in structuring participants' interactions with the course.[3]

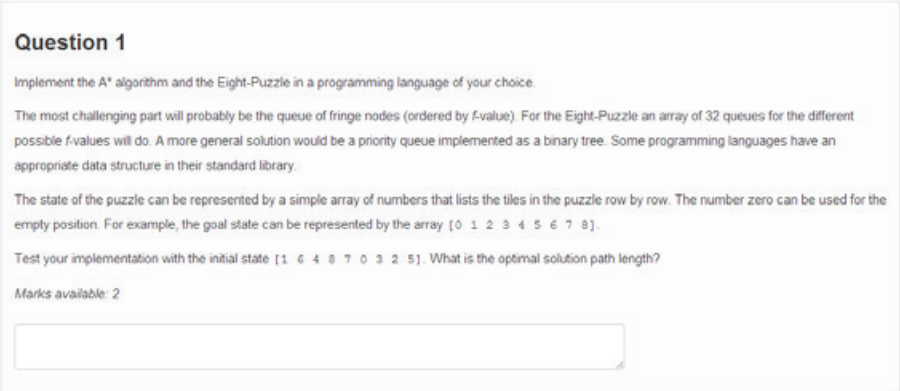

Figure 19: One of the optional programming assignments on AI Planning MOOC: participants could gain a statement of accomplishment without completing these; however, some students requested more regular assignments of this type. © University of Edinburgh 2013, reused under a Creative Commons Attribution licence.

3 The AI Planning MOOC team does, however, intend to continue to promote the social and community collaboration approach in the future repeats of their MOOC, and to more explicitly encourage participation as a way to get feedback and promote the building of technical contacts.

Figure 20: Wordcloud generated from interview transcript: The social aspects featured as strongly as the subject material in discussion with Professor Tate on what drove the AI Planning MOOC design. © Tagxedo (http://www.tagxedo.com) and reused under a Creative Commons Attribution-Non commercial-ShareAlike License 3.0.

Time and teacher visibility

Another issue worthy of discussion in relation to the AI Planning MOOC is the teacher time commitment that was given not just to its development, but also – and contrary to some early expectations of MOOC performance – to its delivery. The University of Edinburgh report on their first-wave MOOCs estimates that 'around 30 days of academic (faculty) time is required for a five to six week MOOC, plus support and coordination time and direct costs (mainly video production and copyright clearance)' (Edinburgh 2013, p.9). Professor Tate noted that the AI Planning MOOC took more time than this average and commented on this time commitment in the following terms:

> It was a bit too intense what we did, too heavy a workload as well. We really were very actively there... [it was] challenging in terms of time management... I'm still getting complaints about the six months we didn't get on holiday!
> ...
> You've got to appreciate how long this stuff takes... Be prepared to continue to engage and be part of the community while you're doing it.

This significant time commitment is not viewed negatively by the academic staff delivering these early MOOCs; in fact, the teachers we spoke to tended to describe the time-intensive interactions with their courses as energising and addictive. For Professor Tate 'it was a stimulating time, stimulating rather than stressful'. However, as and when MOOCs become more mainstream components of academic activity institutions will need to find ways of accounting for the workload they imply, particularly given that MOOC teachers in general appear to want to be highly visible and active in their courses, rather than merely video presences:

> It's not about "the material is there and you guys need to just get on with it", when I've heard those comments about how we can reduce the cost of doing this, I just don't see this. I think we've got to be actively involved and be seen to be actively involved as the teachers on the course.

Open Learning Design Studio's MOOC (OLDSMOOC): when courses get MOOC-ed

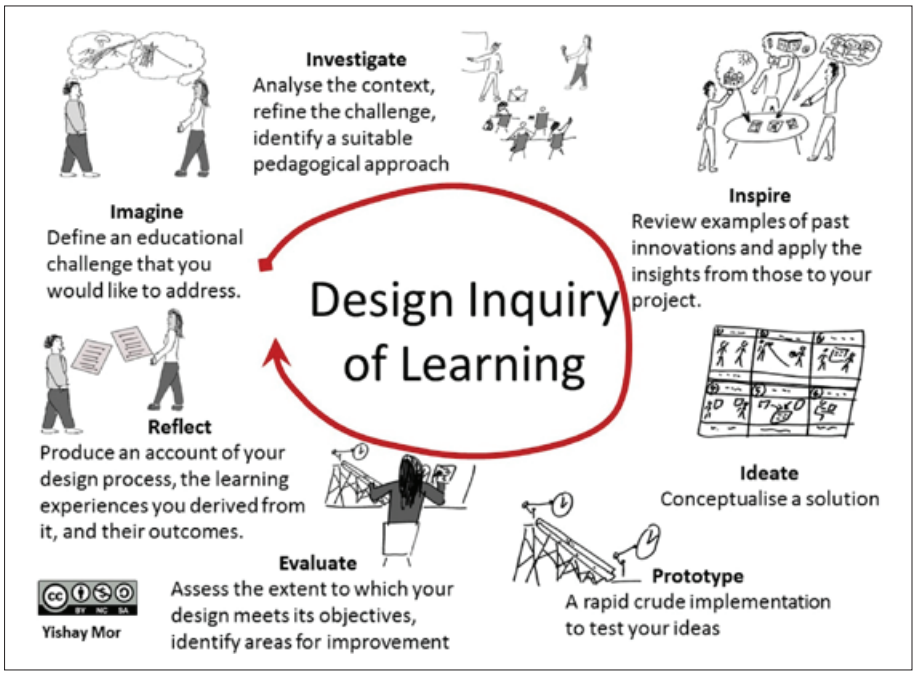

Figure 21: 'Design of inquiry learning cycle' available via: http://www.flickr.com/photos/yish/9951376624/. © Open University, Yishay Mor, 2013 reused under a Creative Commons Attribution, non-commercial, Share Alike licence.

Basics

Institution	Open University & partners: Goldsmiths University of London, London Knowledge Lab, University of Greenwich, University of Leicester, University of Oxford, and University of Georgia
Course lead	Dr Yishay Mor
Start date	10 January 2013
Length	Nine weeks
Platform	Google Pages site, with Cloudworks, Google Hangouts, and Google Groups
Enrolments	2420
'Completions'	According to Cross (2013), between 97-300 active on the course site in the final week; 23 of whom contributed a post or other material
Structure	Project-based, with weekly activities that build towards a group learning design project, or can be undertaken on a standalone basis. Video lectures, discussions, and artefact creation

Assessment	Nine open badges available for levels of participation, completing tasks, and contributing as a peer reviewer and group member
Credit status	None
Website	http://www.olds.ac.uk
Further reading	Cross, S. (2013) Evaluation of the OLDS MOOC curriculum design course: participant perspectives, expectations and experiences, Open University Available at: http://oro.open.ac.uk/37836/

OLDSMOOC was the second MOOC to emerge from the Open University (the first being the Open Translation MOOC). It was distinctive in involving a number of academic partners in its design and delivery, and in approaching its topic through a project-based course structure in which participants formed groups aimed at producing an innovative design for a learning activity or resource. Along with its delivery as a nine-week course, the MOOC remains an open educational resource (OER), and its content continues to be accessed and used.

This snapshot focuses on the team-based approach to the MOOC's development and delivery, and how its project- and group-based design elements – extensively tried and tested in formal face-to-face and online courses – played out in the MOOC context.

A team-based approach

A common narrative of xMOOC teaching is that it privileges the 'rock-star' or celebrity academic and his or her expertise and vision. In practice, and in both 'c' and 'x' style courses, this study suggests that many teachers do not see their role in this way. This is apparent in OLDSMOOC, where the more common approach of having a single (or at least a central) vision informing the course development was rejected in favour of a distributed team-based approach, bringing in experts from a number of universities and with a variety of perspectives. Dr Mor explained the reason for this decision in terms of the importance of diversity in the field of learning design:

> Obviously I could run a MOOC with my own personal take on learning design and it would have been much easier. If I had said 'this is the way I do learning design' and walked you through it, it would have been a five or six week MOOC, very straightforward. But then you wouldn't get a sense of the breadth of the field.

The significance of this undertaking was not lost on the team, who treated it as a learning design challenge in its own right. At a workshop at the start of the design process, they came up with general principles for the MOOC: that each week would have a narrative thread linking the various activities and resources, but that each task would also stand alone and be usable by those who were participating in a casual way; and that each week would fit into an overall outline which followed the shape of a design inquiry. Beginning with those principles, different people took on the leadership of different weeks. The main challenge, once this had been established, was to ensure some coherence and consistency across the course:

> Some cMOOCs are more like lecture series, each week is led by a different facilitator and there are very loose links between one week and the next. We were aiming for something more cohesive, so we wanted people to feel that they are participating in a structured course... So we had a lot of cross reviews, we asked each facilitator to review the week before and the week after to make sure they integrated. We had people co-facilitating different weeks, so you had those voices carrying over from one week to the next. It was very challenging, it was very demanding, but I think overall it gave people a valuable experience.

An unanticipated outcome of the distributed teaching of OLDSMOOC was the high profile it attracted as a result of the participation of so many universities, at a time when MOOCs were just arriving in a big way on the UK scene. This high profile turned high-stakes at a live pre-launch event, which was scheduled to take advantage of the level of interest at the Open University and elsewhere in this new development. However, the attempt to wrap the event's live video stream within Cloudworks (the use of Cloudworks more generally being a condition of the funding JISC provided for OLDSMOOC) created a technical problem when more than 1,000 people tried to view the page simultaneously. While MOOC participants were initially frustrated, they were also understanding; the institutions involved were less relaxed:

> there's a lot riding on these MOOCs in terms of reputation and brand and so on, and obviously the OU was not very happy to be seen as being challenged by the technical aspects of a webcast. And likewise the other institutions, so that did cause a bit of a problem for us. But as time passed and the feedback we got was quite positive, that kind of faded into the background. But I think that everyone who was involved in that event will always remember it.

As we have seen elsewhere, the sorts of high-profile activities that come along with involvement in MOOCs can be exciting for teachers and teams, but they can also be disturbing and even distressing. When the consequences of mis-steps are potentially so visible, there is enormous pressure on teachers to get it right the first time, in a context where 'right' is still evolving. It is easy to see why teams might opt for apparently safe options such as a pre-recorded video-lecture and automated quiz format. It is therefore even more impressive, perhaps, when they attempt other designs, as the OLDSMOOC team did.

When courses get MOOC-ed

OLDSMOOC's course design was neither a 'cMOOC' nor an 'xMOOC', but was based on a 'Learning Design Studio' course format that had proved highly successful in both face-to-face and online contexts. These smaller, formal courses have a group design project at their heart, and typically students invest 10-20 hours per week in what Dr Mor described as 'amazing projects', with groups working closely together to devise, implement and evaluate an educational innovation. The design studio format is based on a constructionist pedagogy which involves creating artefacts and building conversation around them, and it was this pedagogical approach that the academic team took in designing OLDSMOOC, with each week structured around a stage in the design process.

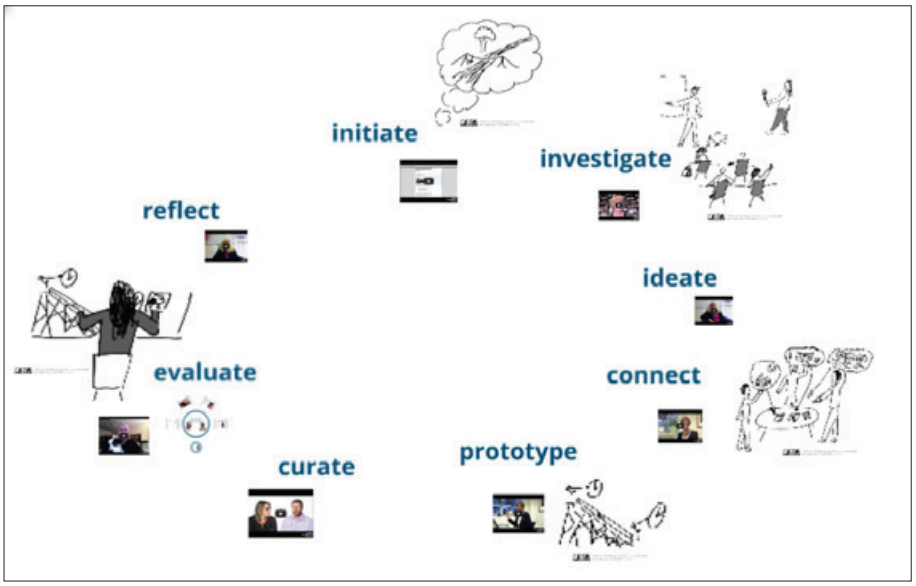

Figure 22: OLDSMOOC weekly structure available via http://prezi.com/b44jwdgvs8nl/olds-mooc-introduction/. © Open University 2013 by Yishay Mor, reused under a Creative Commons Attribution, non-commercial, Share Alike licence.

The team recognised that the sorts of tasks that were being asked of MOOC participants were likely to require intensive facilitation, and a level of teacher input that might prove difficult to achieve:

> If you ask people to produce something and share it in a public space they expect to get some feedback on that. You can leverage peer feedback as much as you can, but still there is value to your interaction.

Dr Mor was forceful in articulating this value, and its implications for a MOOC:

> If you want to have effective conversations then you have to follow the conversation and contribute. That's your role as an educator... Education is all about interaction between teacher and student, and if you think you can just put up a bunch of resources on the web and tell students to just get on with it, you might as well write a book and they can buy it or borrow it from the library. It's not a course. A course is about having a taught experience.

However, the sort of experience that OLDSMOOC participants had was quite different from in the formal courses. As the course experienced the typical steep drop-off in participation seen in most MOOCs, and varied levels of investment among those who remained, the work groups were not stable, and the extended project format was unsustainable in the OLDSMOOC context. So, for example, while about 100 project proposals were submitted in Week 1, only half the participants who submitted these made any further contribution to the course (Cross 2013, p.7). In the end, Dr Mor was aware of several design projects that reached a significant level during the MOOC, and some that where developed afterwards, but none that ran their full course during the period of OLDSMOOC.

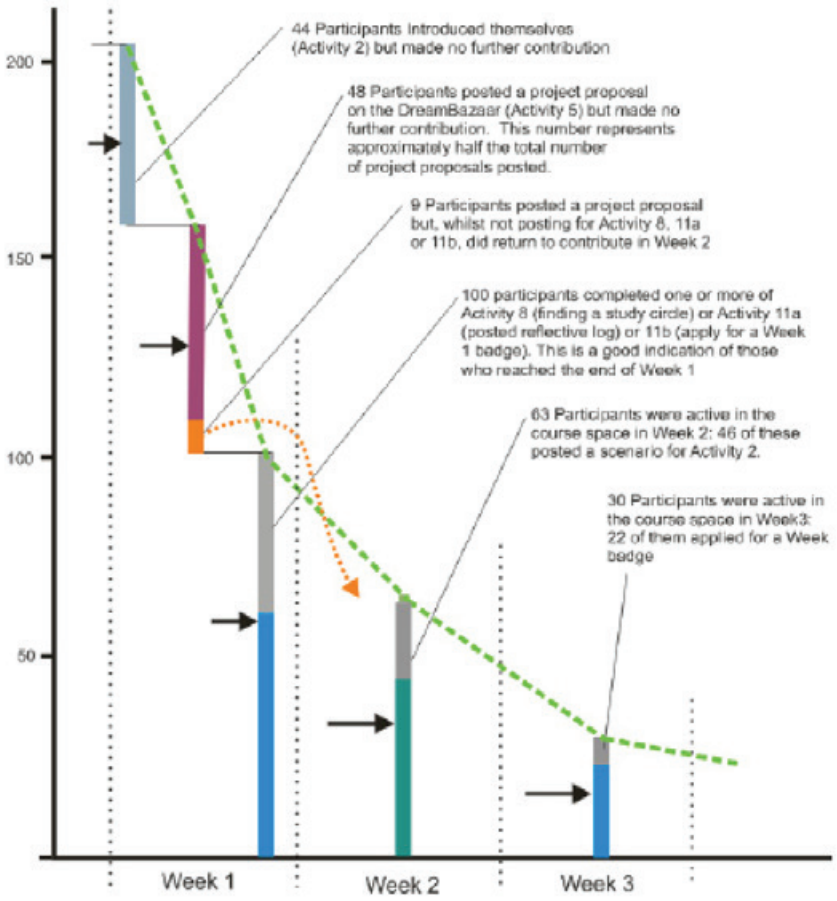

Figure 23: 'Drop-off in participation across the first three weeks of OLDSMOOC' (Cross 2013, p.7). © Open University 2013, available via http://oro.open.ac.uk/37836/ and reused under a Creative Commons Attribution only 3.0 Licence.

This is not to say that people were not participating, however; they were, in an active but ad hoc fashion across the nine weeks of the course. While not exactly what the team had hoped for (though they did deliberately design the course to accommodate this more casual participation), for some participants OLDSMOOC appeared to have a significantly beneficial impact:

> A couple of participants from Canada sent me the sweetest letter along with a bottle of nice Canadian whisky. That's the first time ever that a student sent me a bottle of whisky to thank me for a course. There were quite a few expressions of genuine gratitude. Some of the students found it very rewarding, and as an educator that's the best you can hope for, that people find what you've offered them useful. There's some anecdotal evidence that it has impacted on people's practice and for me that's the greatest measure of success. I think that a lot of MOOCs which people take as more of a leisure activity, you do the MOOC, you enjoy it and you move on. For me it was very important that this will have impact on people's practice, and it seems to be that that is the case.

Part of this success should be attributed to the structured and visible tutor input, which included frequent blog posts synthesising the course activity; weekly 'convergence' sessions in Google Hangouts; comments on the artefacts being generated by participants; and participation in the discussion forums. Dr Mor described teaching the MOOC as 'the most intensive teaching experience of my life. With a huge gap before the next runner up'. For this reason, he says that when asked if he would run a MOOC again he tells people:

Yes, if I had the funding for it. It's not something to do on the side, it does require significant investment. ... I think people need to be aware of that, yes technology can help us reduce the ratios, I think when we get better learning analytics tools and perhaps also intelligent tutoring system type tools ... a bit of AI of some sort will help, but there's no way to replace a tutor.

First Steps in Learning and Teaching: what is 'more'?

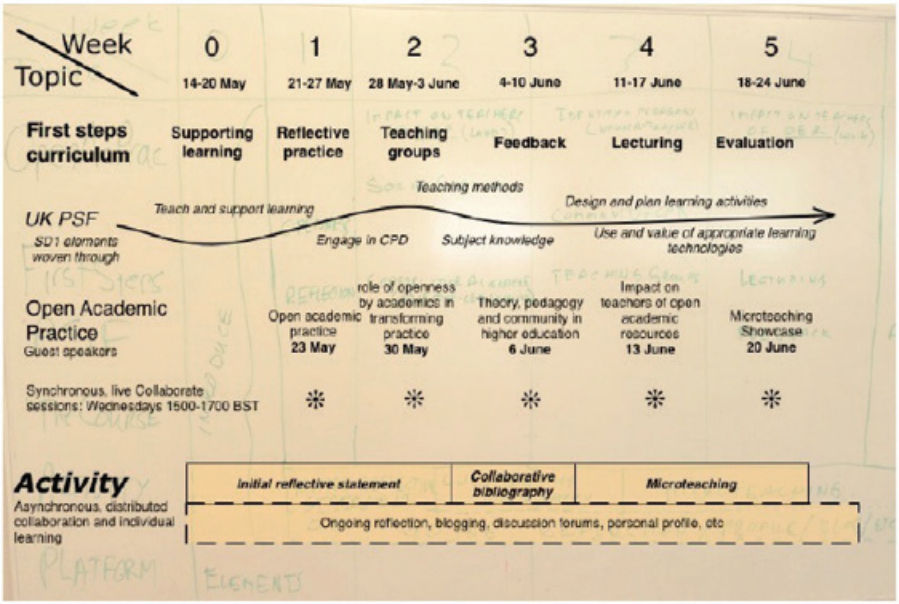

Figure 24: A plan of the course design for the First Steps in Learning and Teaching MOOC. © Oxford Brookes University 2012, licensed under a Creative Commons Attribution-ShareAlike 2.0 UK: England & Wales Licence.

Basics	
Institution	Oxford Brookes University
Course leads	Dr George Roberts, Marion Waite, Elizabeth Lovegrove, Jenny Mackness
Start date	21 May - 22 June 2012; 8 May - 14 June 2013
Length	Five weeks
Platform	Moodle and Wordpress
Enrolments	c.200 (2012), c.300 (2013)
'Completions'	14 received a certificate in 2012; four received formal credit in 2013
Structure	Weekly multimedia introduction, wiki and discussion forum
Assessment	In 2013, up to 25 participants could receive individualised feedback and a certificate, at a cost of £345. Other participants received peer feedback and 'badges' for completing activities and assignments. Reflective statements, collaborative bibliography, microteaching activity, virtual conference presentation
Credit status	FHEQ level 7, 10 credits
Website	http://openbrookes.net/firststeps13/

Further reading

Mackness, J. *et al.* (2013) Learning in a small, task–oriented, connectivist MOOC: Pedagogical issues and implications for higher education. *The International Review of Research in Open and Distance Learning*. **14** (4) http://www.irrodl.org/index.php/irrodl/article/view/1548
Roberts, G. (2013) Activity and interaction in #fslt13 open online course. *rWorld2*. http://rworld2.brookesblogs.net/2013/04/23/activity-and-interaction-in-fslt13-open-online-course/
Roberts, G. (2013) FSLT Open Online Course Accredited! *rWorld2*. http://rworld2.brookesblogs.net/2013/04/12/fslt-open-online-course-accredited/
Roberts, G. (2012) *OpenLine Project: Final Report*. Oxford: Oxford Brookes/HEA. http://openbrookes.net/firststeps12/files/2012/02/brookes_final_report_101012.pdf
Waite, M. *et al.* (2013) Liminal Participants and Skilled Orienteers: Learner Participation in a MOOC for New Lecturers. *Journal of Online Learning and Teaching*. **9** (2) http://jolt.merlot.org/vol9no2/waite_0613.htm

First Steps in Learning and Teaching 2012 (FSLT) was the UK's first self-described MOOC, supported initially by a Higher Education Academy Teaching Development Grant, and is one of the very few MOOCs to have run more than once at the time of writing this report. In addition, the 2013 instance was the first UK MOOC to be formally accredited. This course has served as a launchpad for an institution-led MOOC initiative, which will see at least four new 'Open Brookes' courses, one in each of the university's four faculties, developed for the 2014-15 academic year. The Open Brookes courses are not affiliated with a MOOC provider and, like FSLT, will be developed primarily in Moodle (a virtual learning environment commonly used for online and blended courses). Emerging from an Academic Development unit, FSLT (like OLDSMOOC) is particularly attuned to the pedagogical implications of 'massive' ways of working, and perhaps as a result has been modest in its ambitions: 'we're designing not to 10,000, but to one order of magnitude above 100', as Dr George Roberts, one of the course leads, explained. FSLT and the Oxford Brookes MOOC initiative raise intriguing questions about the range of what the 'massive' in MOOC might mean, and how institutional mainstreaming and accreditation can affect MOOCs and teachers.

To write this snapshot, we conducted a joint interview with Dr George Roberts and Marion Waite, developers and teachers of both instances of FSLT. We have also drawn on the publications noted in the 'further reading' section above.

What is 'more'?

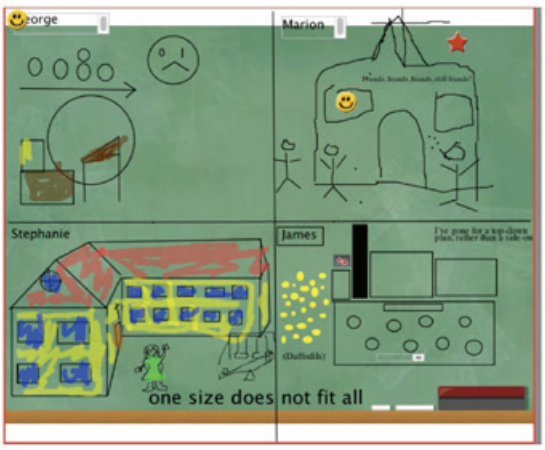

Figure 25: 'Draw your primary school' sketches produced during one FSLT13 participant's microteaching session. Created by George Roberts, Marion Waite, Stephanie Oeben and James Shelton and licensed under a Creative Commons Attribution-ShareAlike 2.0 UK: England & Wales Licence.

Designed along broadly connectivist lines, but also explicitly drawing on principles of dialogic, activity and experiential learning theory, the course developers discussed from an early stage how they could accomplish the kind of contact they considered important in their MOOC, and acknowledged that the challenges of doing so at scale might mean that 'scale' would be relative:

> of course we do these things in order to reach more people, but what is 'more' and how many and what's the quality of the contact that you achieve? (George Roberts)

Based on their experiences in FSLT12, where more experienced participants provided informal guidance and support to those newer to MOOCs, the second session of the course was designed to formally recognise the role of expert participants or 'field experts'. This encouraged a 'cascade effect', where alumni 'champions' received direct support from tutors to offer, in turn, support to small groups of learners. The tutors and technologists were also a substantial presence in the course:

> Given that the MOOC was targeted at new HE lecturers, this MOOC intentionally created a more supportive learning environment than is encountered in some traditional cMOOCs ... the three tutors and three technologists also had a greater 'presence' than is customary in some traditional cMOOCs, providing individual and whole group support, particularly for those participants being assessed, and by monitoring discussions and providing feedback on completed tasks. (Mackness et al. 2013)

A certain kind of teaching, then, was seen as a non-negotiable element of the FSLT experience. Rather than compromise on that vision, it was the 'massive' that had to be reconsidered:

> Our teaching beliefs were played out in the MOOC, but that made the MOOC hard to scale. (George Roberts)

This was not seen as particularly troubling; instead, the FSLT team considers the primary virtues of its course to be its flexibility and openness, features which mean, for example, that participants had 'a wide variety of ways to engage with the course and freedom to set their own patterns of participation ... with no requirement to be involved in all aspects of the course' (Waite *et al.* 2013). It also meant that the course 'created the opportunities and means for more shared and more open engagement with thoughts in progress, right through to knowledge creation, within an emerging peer group' (Mackness *et al.* 2013). For FSLT, the openness of the course was by far its most important, and the most innovative, aspect; its scale hardly signified: 'more important is that FSLT12 was prepared for massiveness and was designed according to cMOOC principles' (Waite *et al.* 2013).

The Brookes way

The independence of the Oxford Brookes MOOC development means that there is clear institutional ownership both of the courses, and the approach taken. So, for example, documents such as the 'What is a Brookes Open Online Course?' discussion paper (seen in draft form for this report) describe the principles of a distinctive, institution-wide style of online learning, which includes MOOC developments. As Dr Roberts put it:

> It wouldn't be 'Brookes' to do a big piece of page-turning software – we want to embody institutional values, which means encouraging the creation of academic and assessment communities of practice.

He went on to observe that:

> Brookes has a view of itself as an institution that does teaching pretty well – that's part of the institutional identity... So courses need to be designed around interaction, not just consumption of content.

In this regard, FSLT has functioned as a pilot for the sorts of MOOCs that *would* be 'Brookes' in their approach, and such an approach is seen as applicable to a wide range of subject areas and course types, being based on dialogic principles, with peer evaluation components, multimedia content elements, and recognition of participant achievement (through badges or certificates). The underlying question informing these developments is 'what sort of experience do we want people to have?' (George Roberts). Marion Waite pointed out that this does not impose limitations on the faculties, and that it will be interesting to see how they interpret these Brookes principles of open online course design.

The shift from pilot stage to an embedded, institutionally-supported project brings with it some benefits, and some challenges. Benefits include the support that comes along with buy-in at high levels of the organisation: this creates a dynamic where Dr Roberts and others 'were pushing on it internally, but we were pushing on an open door'. On the other hand, Dr Roberts and Ms Waite considered that a 'top-down drive may lead to less than enthusiastic compliance' on the ground. This shift, from the vision and sense of ownership which drove the development of the FSLT course, to the institutional drivers now pushing the MOOC initiative forward, is one that many universities may face if and when MOOCs become more mainstream.

As noted in the Vampire Fictions snapshot, MOOC accreditation is another area in which these shifts take place. In 2013, FSLT and a second Open Brookes course were validated as part of a broader programme of provision for new university teachers. For the FSLT team, the early intensity and exhilaration of the MOOC experience gave way, perhaps inevitably, to a sense of the course as more routine. This, they felt, was partly connected to the process of accreditation:

> The first time it took over our lives, it was incredibly intense. It was so much fun, it didn't feel like work – by the second time, the novelty had worn off a bit, there were other discussions going on around validation and credentialing. (George Roberts)

Through that process, they saw the nature of the MOOC itself change:

> The MOOC has becoming increasingly curriculum-driven rather than learner led – quality assurance has driven that shift, along with the MOOCs for credit model. If a MOOC is validated, it has to have assessment schemes, learning outcomes, things that weren't a priority in the first run. (George Roberts)

As the team continues to write and publish about their MOOC experiences, it may become more clear what impact these changes will have on the experience of MOOC participants. In the first instance of FSLT, where a number of free places were offered to participants to have their work formally assessed by the course team, a sense of unease was described by one who was not part of this group: 'assessed students were the real students and we others on the border' (Roberts 2012, p.23). If the team is able to preserve spaces for the openness and flexibility of participation they value, how they address potential divisions between the paying, formally enrolled participants who receive personalised tutor feedback, and those who do not, will be one key aspect of the course's continued success. Their early experiences may be very helpful for other MOOC teams to reflect on, as initiatives like the 'signature track' in Coursera provide 'added extras' for participants who are in a position to pay for them, and more MOOC teachers must grapple with the implications of teaching a course where some participants are paying for their attention.

Web Science and the launch of FutureLearn: teaching assemblages and platform negotiations

Figure 26: Technology planet. Vector illustration © Bellenixe 2013, purchased from www.istockphoto.com/stock-illustration-20238121-technology-planet-vector-illustration.php

Basics

Institution	University of Southampton
Course leads	Professor Les Carr and Professor Susan Halford
Start date	11 November 2013
Length	Six weeks
Platform	FutureLearn
Enrolments	13,000
'Completions'	Unknown [numbers not counted until mid January 2014]
Structure	Weekly videos, readings, tasks, quizzes and discussion activities; a Google hangout and one opportunity for attendance in person
Assessment	Weekly quizzes, end of course test quiz, optional peer review activity
Credit status	None; offered at unspecified level
Website	https://www.futurelearn.com/courses/web-science
Further reading	FutureLearn blog: http://about.futurelearn.com/blog/ Web Science MOOC blog: http://moocs.southampton.ac.uk/websci/

In this snapshot we attempt to take account of what is a significant moment for UK MOOCs: the launch of the Open University-led platform FutureLearn. Here, we take a look at FutureLearn in the period around its launch but before any course completions: an interesting time for discussion, in which the possibilities and potentials for a new way of thinking about MOOCs are foregrounded over outcomes. We interviewed Professor Les Carr at Southampton, who is one of the leads on an early FutureLearn MOOC in Web Science; Professor Carr gives an interesting perspective on what it has meant to design within FutureLearn at this beta stage of its development. We also spoke to Professor Mike Sharples, academic lead at FutureLearn, who was able to provide an overview of the FutureLearn platform and the pedagogic intentions behind its design and launch.


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KNOW
Peer
TERMS
DELIVER
students
TALKING
ACADEMIC
PROFESSOR
celebrating
PARTICULAR
GOOD
PROGRESS
SORTS
INVOLVED
EARLY
POSSIBLE
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BIT
Scale
EXAMPLE
TEAM
REVIEW
STRUCTURE
participants
Profile
achievement
perspective
success
NUMBER
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ANALYTICS
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MEDIA
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ARENT
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ASSOCIATED
ROADMAP
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ORGANISED
BACKGROUNDS
FEELING
TECHNOLOGY
RELATIONSHIPS
ENTHUSIASTIC
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ACCOMPLISHMENT
CONSENSUS
CONVINCED
DISCUSSIONS
INTERVIEWS
PARTICIPANTS
GOOGLE
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This is perhaps simply indicative of the apparent need within the UK and Europe to define our MOOC offer as distinct from its US equivalents. On the other hand, this notion that MOOC pedagogy can embody a nationally- or supra-nationally aligned set of pedagogic principles perhaps does not take account of what we have found to be the heterogeneity of the UK MOOC offer, and the likely heterogeneity of FutureLearn MOOCs themselves. Apparently discipline-agnostic teaching approaches emerging from the Open University here stand in for – and potentially mask – the variety of teaching approaches developed online and offline within other institutional and disciplinary contexts. However the transparency and clarity of FutureLearn's approach in building this platform around a specific set of principles – broadly, those of social constructivism – is to be welcomed.

To summarise, and according to the FutureLearn blog (Sharples 2013), principles of social constructivism at scale are designed into FutureLearn via:

- world-class storytelling;
- social learning;
- celebrating progress.

Thus while high quality content is clearly important to FutureLearn, the impetus to embed social learning is demonstrated by the tight linking of content with social interaction: discussion forums are associated with content elements, rather than grouped separately as we see with other platforms. To illustrate, we use screenshots from the 'Secret Power of Brands' MOOC, offered by the University of East Anglia, which was live at the time of writing.

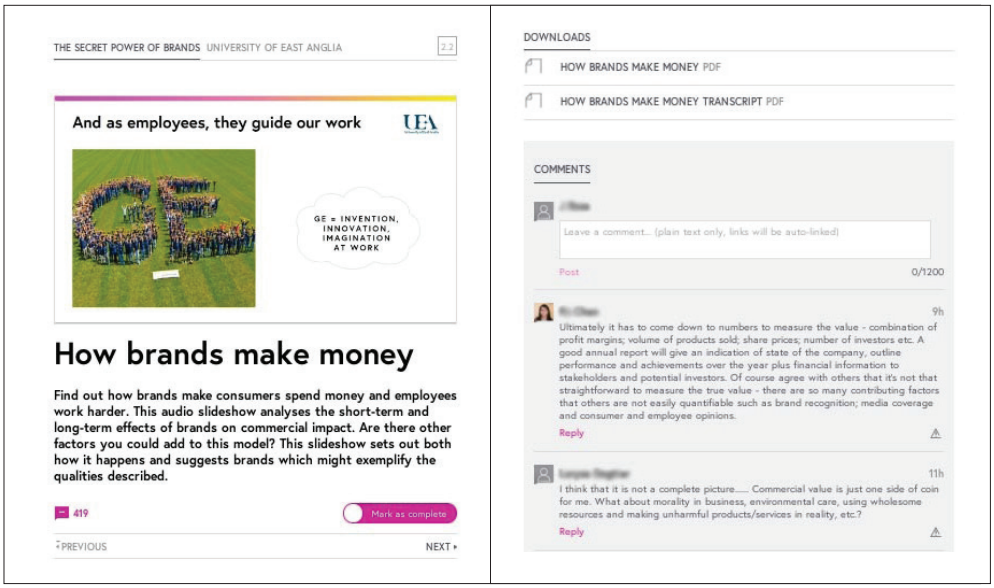

Figure 28: Shows how a discussion thread is embedded alongside a piece of course content in the FutureLearn platform. © FutureLearn 2013.

With functionality for peer review and peer assessment planned for inclusion imminently, FutureLearn currently embeds a system of reputation-building within each MOOC. This provides the capacity for each learner to 'follow' other individuals (in a way recognisable to Twitter users), which could work as a strong motivation for learners to maintain the quality of their discussion postings and other interactions, particularly when reputation can be – as is the intention – linked to a learner's record of achievement.

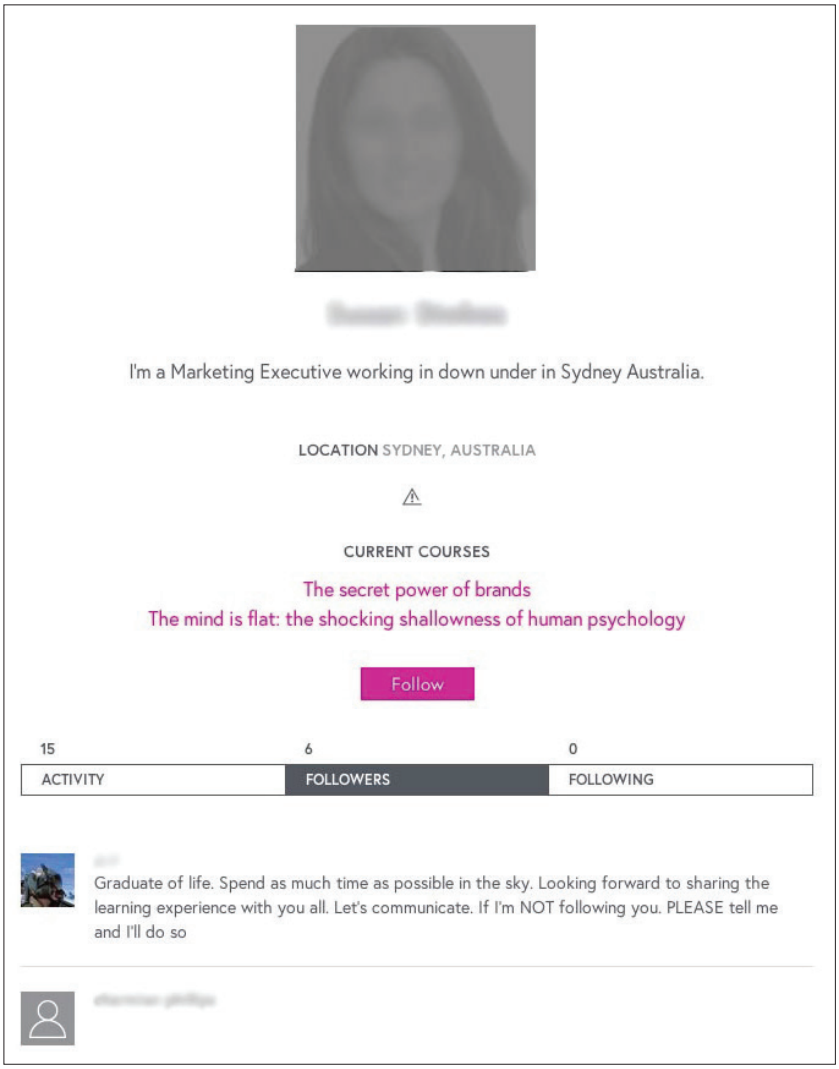

Figure 29: Each learner's profile makes visible reputation markers in the form of followers and activity level. © FutureLearn 2013.

Records of achievement and personal profile pages offer, according to Professor Sharples, a way in for learners to the notion of 'storytelling', enabling them to 'tell the story' of what they have accomplished over the period of the MOOC. Other modes of storytelling include the progress functions built into FutureLearn to indicate 'flow', and allow 'catch-up' and reprise: 'to do' pages, visualisations of progress through the course and a commitment to a general principle of visibility as applied to learner activity and achievement.

However, as we have seen in previous snapshots, MOOC pedagogy is not something embedded within the platform technical build, but is something that emerges in complex negotiation between platform, the teaching approaches of the academic team developing the course, disciplinary and institutional norms and expectations, and the pattern of learner interactions as the course is played out. In the case of the Web Science MOOC – one of the first to launch through FutureLearn – the pragmatics of managing delivery on time and to the right quality put pressure on concerns with a pedagogic rationale that perhaps remained implicit. And, as Professor Carr, one of the Web Science leads points out, this is 'fair enough':

> The problem of getting 20 universities to sign up for doing something radically different, possibly threatening to their business, certainly disruptive, on a platform that doesn't exist, with zero precedent in the UK, actually that is really significant activity in itself.

While saying that 'We design learning experiences, then find out we can't do that', because of platform limitations, Professor Carr was relatively sanguine about the limited functionality at this beta stage of platform development, recognising instead the achievement of getting FutureLearn launched. The potential of the platform for offering a new kind of MOOC – one which places good quality content within a framework structured around the social – is clear, even given the relatively pared-back functionality of the beta launch.

At the same time, Professor Carr suggests that some of the more complex activities he would have liked to include could have been achieved by using existing web services outside the MOOC, 'if only you were prepared for handling the complexity of that externally'. This points to an important issue for course developers within all the MOOC platforms, which is the extent to which they keep learner activity within the platform 'walls', and the extent to which they engage with the wider social web. Simplicity in delivery is one motivation for keeping course activity within platform; another is the drive to generate coherent learning analytics. As Professor Sharples pointed out, while FutureLearn is categorically not discouraging people from using existing web-based social media, there is a strong rationale for keeping the social tools within the platform because:

> it means we can also use the analytics that come from that in a number of ways. One, we can provide a learner with a course profile which can be used as part of the assessment process, so it can be a record of achievement which they can then use with employers or for other purposes. And the educators can get a dashboard of what's happening not only with content access but also with social learning, and we can use it for feeding back into the learning design process so we can see what needs to be improved, and what needs to be changed.

On the one hand, the desire to generate meaningful analytics by keeping activity within platform seems quite reasonable; on the other, it would perhaps be a loss if the drive for analytics were to propel online pedagogy back into an earlier era of hermetically-sealed 'VLEs' and a creeping functionalism that neglects the richer serendipities of pedagogic engagement across the wide social web. The opening of FutureLearn content to web searches may go some way toward addressing this question of openness to the wider web.

Teacher as assemblage and network pedagogy

The necessity for teacher visibility, something which has come through strongly in other snapshots, is accounted for in the FutureLearn platform via a disaggregation of the teaching function in the interests of scalability. So, as Professor Sharples explains, FutureLearn has three active 'teacher roles' built in:

- Educator
  'the person with the expertise, the star performer... the visible face of the course'.

- Host
  'the one who is engaging with the students directly and is providing academic input'.

- Mentor
  'their role is to facilitate discussions, and it may well be that some of that mentoring role comes up from the community itself.'

In talking with Professor Carr an equally disaggregated, though perhaps less hierarchical, configuration of the teacher role emerged. For the Web Science MOOC, the teacher role is performed across a network of involved participants, and is strongly embedded within a particular disciplinary orientation:

> we have an inter-disciplinary subject and course that we can plunder both relationships in terms of getting lots of people to participate, and material and curriculum ... it's something that's coming from the whole network, the Web Science doctoral training centre, so we're all involved in it. We're a community of learners.

Professor Carr emphasised that the teaching role in the Web Science MOOC will be performed equally, though across different registers and in different modes, by: doctoral students taking a role in discussion board support; MOOC participants, many of whom it is anticipated will themselves have expertise in web science; the named 'educators' (Professor Carr and Professor Susan Halford); other academic colleagues contributing to weekly topic areas; and the 'celebrity' academics associated with the course (Professor Dame Wendy Hall and Professor Sir Nigel Shadbolt):

> we have a big inter-disciplinary team, so we've engaged the whole network to deliver this thing ... we've been very keen to show off the fact that what we have in the university is a network of professionals operating at different levels, and some of them are celebrity professors who are around once in a blue moon, and some are lecturers and some of them are research students – they each have a role to play in this MOOC.

Interestingly, the commitment to the notion of participants as part of this network extends from the online to the face-to-face; Web Science will offer two 'meet-the-MOOCsters' events during the period of its first run:

> In week 1 we're inviting people to come to Southampton so they can meet us, talk about Web Science... If people really do want to meet the celebrity professors, let's give people the chance to press the flesh. And we want to encourage this as a network of people – let them come and talk to each other as well as to us. And in week 6 we're going to do the same thing in London.

Figure 30: Image of the educators leading this course. © FutureLearn 2013.

It is interesting to end this snapshot by looking once more at platform design and what configuration of the teacher it makes available. Where the three hierarchical teacher roles designed in to the FutureLearn platform (educator, host, mentor) contrasted with the flatter 'network' principle described above, according to Professor Carr the options for teacher visibility structured-in by the platform paint their own interesting portrait of the teacher as 'assemblage':

> Susan and I have our name at the top of it, and interestingly enough, the FutureLearn design assumed that there would be a single individual who would be responsible for the course so we've had to have a photograph of the two of us standing very close together, and the name of this person is ProfessorSusanHalfordandProfessorLeslieCarr, so we are a single being as far as the software is concerned.

5. Conclusion

In concluding the report we wish to emphasise three key messages:

1 MOOCs are multiple: we can no longer define them either as a single 'transformative' entity or clearly position them in terms of the previously dominant cMOOC/xMOOC binary.

2 MOOC pedagogy is not embedded in MOOC platform, but is negotiated and emergent, a sociomaterial and discipline-informed issue.

3 The teacher persists in the MOOC: though reworked and disaggregated, the teaching function and teacherly professionalism remain central.

MOOCs are multiple

As we have seen, the UK MOOC landscape is much more varied and has a longer history than might be assumed given recent press coverage, which has focused on the launch of FutureLearn and, before that, the early engagement of the University of Edinburgh and University of London International Programmes with Coursera. The UK has, of course, a long history of innovation in open education (the Open University being the most obvious embodiment of this); more immediately, early open courses like the ones offered by the Coventry University Open Media Classes, and 'connectivist'-oriented early MOOCs (for example Oxford Brookes' 'First Steps' MOOC) did important early work in thinking through the implications of the new kinds of openness and massiveness that we are experiencing in this current moment.[5]

Thus when the more high profile UK MOOCs began to be offered in early 2013, it was already the case that they had a longer and more nuanced genealogy, and more heterogeneous form, than might have been evident from press and media commentary, which tended to emphasise them as radically transformative, unprecedentedly *different* modes of higher education teaching that would revolutionise the sector. In this context, the pedagogic richness and variety of MOOCs received relatively little attention, and it is still the case that where MOOC pedagogy is discussed, it has often tended to be flattened out into a binary understanding driven by the xMOOC/cMOOC distinction. MOOCs, as we have seen, are already more than one thing: the proliferation of acronym-play around the term – BOOC, SPOC, POOC, DOCC – is indicative of this sense in which 'the MOOC' is becoming multiple.

As we have attempted to illustrate here in our snapshots, MOOC pedagogy itself takes multiple forms, and can rarely be tightly aligned either with a purely instructivist, outcomes- and content-oriented ethos, or with an entirely collaborative, social and open approach. In this sense, the cMOOC/xMOOC binary has had its day. Each MOOC weaves its own path through these different ways of 'doing' and enacting MOOC design and delivery, and there is scope both in institutional thinking and research to do more work in drawing out and analysing MOOC pedagogy at the more micro levels of institutional culture and individual MOOC design. Doing so enables us to focus with more clarity on what we actually mean when we talk about MOOC pedagogy, and to understand in greater depth which factors converge to enable a MOOC pedagogy to be enacted. This relates to the next of our key points.

5 We have seen a similar pattern in the US, where press and media coverage of the big platform providers has tended to 'write out' the contribution of the early Canadian 'cMOOC' innovators in its focus on the growth of the big Silicon Valley players (see Watters 2013 for a trenchant analysis of this trend in the US).

MOOC pedagogy is a sociomaterial and disciplinary issue

MOOC platforms are commonly aligned with particular orientations towards pedagogy. Coursera, for example, promises a pedagogy informed by 'retrieval and testing', 'mastery learning' and 'peer assessment' (Coursera, Pedagogical Foundations), while FutureLearn is designed around a set of social constructivist principles to do with 'storytelling', 'discussion', 'visible learning' and 'community supported learning' (FutureLearn, Why it works). There are precedents for this approach in pre-MOOC virtual learning environment design: for example, Moodle's claim that it is 'guided by a "social constructionist pedagogy"' (Moodle, Philosophy). That platform designers work to a set of established pedagogical principles – and make those explicit – is positive, and there is no doubt that platform design informs the way in which MOOC pedagogy is made material and then played out.

However, we should be wary of overestimating the extent to which particular MOOC pedagogies are embedded in, or even particularly enabled by, MOOC platforms: rather we need to place emphasis on the many agents and influences that come to bear on the final shape of a MOOC design and pedagogic approach. For example, just drawing on the examples discussed in this report, it is clear that multiple social and material influences converge when MOOC pedagogy is enacted: teacher preferences and beliefs, disciplinary influences, patterns of learner expectation and engagement, and other contextual factors such as institutional teaching culture or the desire to generate analytics. Platform functionality and ethos work as one element in the sociomaterial mix, rather than a guarantor of pedagogic coherence. Theories of the sociomaterial can help us here, as practitioners and institutions, in thinking through the ways in which MOOC pedagogies are played out through multiple connections: 'human and non-human, social discourses, activities and meanings, as well as material forces, assemblages, and transformations' (Fenwick *et al.*, p.2).

Disciplinarity emerged in our snapshots as a key influence on UK MOOC pedagogy. Where the influence of disciplinary culture has been well-researched in the general literature on higher education teaching, learning and research (for example Kreber 2009, Trowler 2008), the MOOC literature has not to date taken it much into account, focusing rather on issues of platform determination or generic discipline-agnostic frameworks like 'connectivism' or 'social constructivism'. Yet we saw pedagogic approaches being very tightly aligned to disciplinary 'ways of thinking and practicing' (McCune and Hounsell 2005), from the 'network pedagogy' of the Web Science MOOC, to the 'pedagogy of the undead' of Vampire Fictions. Modes for community formation and social learning already feature strongly in MOOC literature and debate, but these tend not to be related to disciplinary context or to the role of the teacher as disciplinary guide or gatekeeper. However if, as Northedge and McArthur (2009) point out, 'HE can be understood as providing students with interim access to a discipline community' (p.110), we perhaps need to give more attention to the ways in which these aspects of the social are specific to the disciplinary context of the MOOC. This leads us to our final point, which relates to the function of the teacher in the MOOC.

The MOOC teacher persists

The 'teacher function' within the MOOC is disaggregated and re-worked in different ways, depending on platform and pedagogy. Platform-defined roles speak their own definition of how 'the teacher' might be understood, from the 'educator, host and mentor' of FutureLearn, to the 'instructor, teaching assistant and community teaching assistant' of Coursera. Other aspects of the teacher function are informed by more discursive constructions that circulate through practitioner and researcher networks: from the 'facilitator' and 'fellow node' privileged by those drawn to 'connectivist' approaches, to the celebrity academic or role model suggested by the promise of access to the 'world-class professor' in Coursera (Coursera, About us).

There are two main points to make here. The first is that regardless of how the teacher function is disaggregated and redescribed, the need to value the notion of the teacher within the MOOC remains: MOOC teaching is high - visibility, high risk and dependent on significant intellectual, emotional and time commitment from academics and the professionals who work alongside them. MOOC pedagogy functions, to a significant degree, as a representation of these teachers' disciplinary, pedagogic and personal orientations to the challenging task of course delivery in the open, and at scale.

At the same time, however, we need to be prepared to rethink how certain teacher-functions are enacted in MOOC space, and by whom, or what. Machinic substitutions for teacher feedback are already common in MOOCs that apply automatic marking to quizzes and assessments. The 'teacher as code' is likely to become more of a feature, as assessment technologies like Automated Essay Scoring, already subscribed to by the MOOC platform EdX, become common (see Balfour 2013 for a useful review). Intelligent tutoring and adaptive learning systems for MOOCs, informed by advances in natural language processing and learning analytics, are likely to further orient MOOC pedagogy toward the non-human teacher. A challenge here is to balance what is good in machinic intervention in the teaching function with a critical understanding and valuing of the professionalism and pedagogic capacities of the human teacher.

Machinic interventions in the teacher function along the lines of those described above, go alongside social interventions and the spreading of this function among communities of learners: when teaching is delivered at massive scale, we need to understand how best to enable learning communities to coalesce around shared matters of concern. From the reputation-building functions of FutureLearn, to the introduction of Community Teaching Assistants in Coursera, and the long-running commitment of the 'cMOOCs' to the patterns and formations of the personal learning network, we see the higher education community engaging with this aspect of the teacher function with energy and commitment. Again, the challenge here is in balancing the nurturing of massive-scale learning community with an understanding of the role of the teacher as an important, and irreplaceable, 'way in' to disciplinary community. We also perhaps need to be wary of the tendency toward 'learnification' (Biesta 2005, 2012) which can be evident in some MOOC discourses: a focus on the assumed 'needs' of the learner which leaves no room for wider debate on the social, material and political contexts of education itself.

These challenges are significant. However, as this report has attempted to make clear, the richness, variety, quality and profusion of MOOCs within UK universities to date place us in a privileged position as academics, practitioners, policymakers and researchers. As a community, we are well poised to take this new trend in digital education into a future in which its pedagogies are mainstream, well understood, and conducted to a set of standards which align with the outstanding quality of UK higher education.

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7. Appendix: UK MOOCs

MOOCs which have run at least once (as of end 2013)

MOOC name	Institution	Contacts	Time of running	Platform	Link
First Steps into Learning & Teaching in Higher Education	Oxford Brookes University	Dr George Roberts, Marion Waite *et al.*	May-June 2012; 08 May to 14 June 2013 (five weeks long)	WordPress, Moodle	http://openbrookes.net/firststeps12/
Open Translation (OT12)	Open University	Dr Tita Beavan	15 October to 7 December 2012 (eight weeks long)	Openlearn lab space	http://labspace.open.ac.uk/course/view.php?name=OT12
Introduction to Philosophy	University of Edinburgh	Dr Dave Ward, Prof Duncan Pritchard, Dr Michela Massimi, Dr Suilin Lavelle, Dr Matthew Chrisman, Dr Allan Hazlett and Dr Alasdair Richmond	Jan 2013 and 14 Oct 2013 (seven weeks long)	Coursera	https://www.coursera.org/course/introphil
E-learning and Digital Cultures	University of Edinburgh	Dr Sian Bayne, Jeremy Knox, Dr Hamish A. Macleod, Dr Jen Ross and Dr Christine Sinclai	Jan 2013 and 4 Nov 2013 (five weeks long)	Coursera	https://www.coursera.org/course/edc
Astrobiology and the Search for Extraterrestrial Life	University of Edinburgh	Prof Charles Cockell	Jan 2013 and Jan 2014 (five weeks long)	Coursera	https://www.coursera.org/course/astrobio
Artificial Intelligence Planning	University of Edinburgh	Dr Gerhard Wickler and Prof Austin Tate	Jan 2013 and 13 Jan 2014 (six weeks long)	Coursera	https://www.coursera.org/course/aiplan
Critical Thinking in Global Challenges	University of Edinburgh	Mayank Dutia and Dr Celine Caquineau	Jan 2013 and 20 Jan 2014 (five weeks long)	Coursera	https://www.coursera.org/course/criticalthinking
Equine Nutrition	University of Edinburgh	Dr Jo-Anne Murray	Jan 2013 and 27 Jan 2014 (five weeks long)	Coursera	https://www.coursera.org/course/equinenutrition
OLDSMOOC (Learning design for a 21st-century curriculum)	Open University/ Collaborative	Dr Yishay Mor	10 Jan 2013 (nine weeks long)	Google Pages site, with Cloudworks, Google Hangouts, and Google Groups	https://sites.google.com/a/olds.ac.uk/oldsmooc/

MOOC name	Institution	Contacts	Time of running	Platform	Link
Open education (H187open)	Open University	Professor Martin Weller	16 March 2013 (seven weeks long) - Masters Level	OpenLearn, blogs, Twitter etc	http://www.open.edu/openlearn/education/open-education/content-section-0
Open Course on Technology Enhanced Learning	Association of Learning Technology	David Jennings	4 April- 17 June 2013 (11 weeks long)	WordPress, FeedWordPress JiscMail	http://octel.alt.ac.uk
Sustainable Healthy Diets	University of Sheffield	Dr Angie Clonan, Dr Michelle Holdsworth	June 2013 (five weeks long)	Coursesites	http://www.shef.ac.uk/scharr/prospective_students/moocs/dietsmooc
English Common Law	University of London International Programmes	Professor Adam Geary	Jun 2013 (six weeks)	Coursera	https://www.coursera.org/course/engcomlaw
The Camera Never Lies	University of London International Programmes	Dr Emmett Sullivan	Jun 2013 (six weeks)	Coursera	https://www.coursera.org/course/lyingcamera
Creative Programming for Digital Media & Mobile Apps	University of London International Programmes	Dr Marco Gillies, Dr Matthew Yee-King and Dr Mick Grierson	10 Jun 2013 (six weeks long)	Coursera	https://www.coursera.org/course/digitalmedia
Malicious Software and its Underground Economy: Two Sides to Every Story	University of London International Programmes	Dr Lorenzo Cavallaro	17 Jun 2013 (six weeks long)	Coursera	https://www.coursera.org/course/malsoftware
The Health Inequalities MOOC	University of Sheffield	Katie Powell, Dr Jill Thompson, Professor Paul Bissell	July 2013 (five weeks long)	Coursesites	http://www.shef.ac.uk/scharr/prospective_students/moocs/himooc
Vampire Fictions MOOC	Edge Hill University	Dr Ben Brabon	3 Sept 2013 (12 weeks long)	Coursesites e-Gothicist	http://www.edgehill.ac.uk/english/courses/vampire-fictions/
The secret power of brands	University of East Anglia	Robert Jones	14 October 2013 (10 weeks long)	FutureLearn	https://www.futurelearn.com/courses/secret-power-of-brands

Fairness and nature: When worlds collide	University of Leeds	Jon Lovett	21 October 2013 (two weeks long)	FutureLearn	https://www.futurelearn.com/courses/when-worlds-collide/
Health Technology Assessment MOOC	University of Sheffield	Dr Chris Carroll and Claire Beecroft	28 Oct 2013 (five weeks long)	Coursesites	http://scharr.dept.shef.ac.uk/ihta/html/course-structure/hta-mooc.html
Begin programming: build your first mobile game	University of Reading	Karsten Øster Lundqvist	28 October 2013 (seven weeks long)	FutureLearn	https://www.futurelearn.com/courses/begin-programming
Web science: how the web is changing the world	University of Southampton	Professor Les Carr and Professor Susan Halford	11 November 2013 (six weeks long)	FutureLearn	https://www.futurelearn.com/courses/web-science
Introduction to ecosystems	Open University	David Robinson	18 November 2013 (six weeks long)	FutureLearn	https://www.futurelearn.com/courses/ecosystems
Improving your image: dental photography in practice	University of Birmingham	Mike Sharland	2 December 2013 (four weeks long)	FutureLearn	https://www.futurelearn.com/courses/dental-photography-in-practice

FutureLearn and Coursera MOOCs planned for 2014

MOOC name	Institution	Contacts	Time of running	Platform	Link
Sustainability, society and you	University of Nottingham	Sarah Speight	6 January 2014, eight weeks	FutureLearn	https://www.futurelearn.com/courses/sustainability-society-and-you
Introduction to forensic science	University of Strathclyde	Jim Fraser	6 January 2014, six weeks	FutureLearn	https://www.futurelearn.com/courses/introduction-to-forensic-science
Climate change: challenges and solutions	University of Exeter	Tim Lenton	13 January 2014, eight weeks	FutureLearn	https://www.futurelearn.com/courses/climate-change-challenges-and-solutions
Critical listening for studio production	Queens University Belfast	Chris Corrigan	13 January 2014, seven weeks	FutureLearn	https://www.futurelearn.com/courses/critical-listening-for-studio-production
Shakespeare's Hamlet: text, performance, and culture	University of Birmingham	Michael Dobson	13 January 2014, six weeks	FutureLearn	https://www.futurelearn.com/courses/shakespeares-hamlet
Inside Cancer	University of Bath	Dr Momna Hejmadi	20 January 2014, six weeks	FutureLearn	https://www.futurelearn.com/courses/inside-cancer
Preparing for uni	University of East Anglia	Harriet Jones	20 January 2014, six weeks	FutureLearn	https://www.futurelearn.com/courses/preparing-for-uni
Causes of war	King's College London	David Easter	27 January 2014, six weeks	FutureLearn	https://www.futurelearn.com/courses/causes-of-war
Corpus linguistics: method, analysis, interpretation	Lancaster University	Tony McEnery	27 January 2014, eight weeks	FutureLearn	https://www.futurelearn.com/courses/corpus-linguistics
Exploring our oceans	University of Southampton	Jon Copley and Verity Nye	3 February 2014, six weeks	FutureLearn	https://www.futurelearn.com/courses/exploring-our-oceans
Teaching Computing, Part 1	University of East Anglia	Helena Gillespie	3 February 2014, four weeks	FutureLearn	https://www.futurelearn.com/courses/teaching-computing-part-1
The discovery of the Higgs boson	University of Edinburgh	Christos Leonidopoulos	10 February 2014, seven weeks	FutureLearn	https://www.futurelearn.com/courses/higgs
Exploring anatomy: The human abdomen	University of Leeds	James Pickering	10 February 2014, three weeks	FutureLearn	https://www.futurelearn.com/courses/anatomy

MOOC name	Institution	Contacts	Time of running	Platform	Link
Understanding drugs and addiction	King's College London	Kyle Dyer	17 February 2014, six weeks	FutureLearn	https://www.futurelearn.com/courses/understanding-drugs-and-addiction
A beginner's guide to writing in English for university study	University of Reading	Steve Thomas	17 February 2014, four weeks	FutureLearn	https://www.futurelearn.com/courses/english-for-study
Good brain, bad brain: Parkinson's disease	University of Birmingham	Alison Cooper	24 February 2014, three weeks	FutureLearn	https://www.futurelearn.com/courses/good-brain-bad-brain-parks
Good brain, bad brain: Parkinson's disease	University of Birmingham	Alison Cooper	24 February 2014, three weeks	FutureLearn	https://www.futurelearn.com/courses/good-brain-bad-brain-parks
Discover dentistry	University of Sheffield	Christopher Stokes	3 March 2014, six weeks	FutureLearn	https://www.futurelearn.com/courses/discover-dentistry
Muslims in Britain: changes and challenges	Cardiff University	Professors Sophie Gilliat-Ray	10 March 2014, four weeks	FutureLearn	https://www.futurelearn.com/courses/muslims-in-britain
Warhol	University of Edinburgh	Dr Glyn Davis, Dr Sian Bayne and Dr Jen Ross	TBC	Coursera	https://www.coursera.org/course/warhol
Philosophy and the Sciences	University of Edinburgh	Dr Michela Massimi, Dr Alasdair Richmond, Dr Suilin Lavelle, Dr David Carmel, Dr Mark Sprevak, Professor Duncan Pritchard, Professor Andy Clark, Professor John Peacock, Professor Barbara Webb, Dr Kenny Smith and Dr Peggy Series	TBC	Coursera	https://www.coursera.org/course/philsci
Animal Behaviour and Welfare	University of Edinburgh	Professor Nat Waran, Dr Fritha Langford and Heather J Bacon	TBC	Coursera	https://www.coursera.org/course/animal
Fundamentals of Music Theory	University of Edinburgh	Dr Michael Edwards, Dr Zack Moir and Richard Worth	TBC	Coursera	https://www.coursera.org/course/musictheory

MOOC name	Institution	Contacts	Time of running	Platform	Link
Introduction to the Clinical Psychology of Children and Young People	University of Edinburgh	Professor Matthias Schwannauer	TBC	Coursera	https://www.coursera.org/course/clinicalpsych
AstroTech: The Science and Technology behind Astronomical Discovery	University of Edinburgh	Professor Andy Lawrence and Catherine Heymans	TBC	Coursera	https://www.coursera.org/course/astrotech
Cancer in the 21st century - the genomic revolution	University of Glasgow	Leah Marks	TBC, six weeks	FutureLearn	https://www.futurelearn.com/courses/cancer-and-the-genomic-revolution
England in the time of King Richard III	University of Leicester	Deirdre O'Sullivan	TBC, six weeks	FutureLearn	https://www.futurelearn.com/courses/england-of-richard-third-2014
Why We Need Psychology	University of London International Programmes	Dr Simon Green	TBC	Coursera	https://www.coursera.org/course/needpsych
Innovation and enterprise	Loughborough University	Dr Julie Holland	TBC, six weeks	FutureLearn	https://www.futurelearn.com/courses/innovation-and-enterprise
Water Supply and Sanitation Policy in Developing Countries	University of Manchester	Prof Dale Whittington and Dr Duncan Thomas	TBC	Coursera	https://www.coursera.org/course/water
Global Health and Humanitarianism	University of Manchester	Dr Tim Jacoby	TBC	Coursera	https://www.coursera.org/course/health
An Introduction to Population Health	University of Manchester	Professor Aneez Esmail and Dr Katie Reed	TBC	Coursera	https://www.coursera.org/course/population
Our Earth: Its Climate, History, and Processes	University of Manchester	Prof David M. Schultz	TBC	Coursera	https://www.coursera.org/course/ourearth
The mind is flat: the shocking shallowness of human psychology	University of Warwick	Nick Chater	TBC, six weeks	FutureLearn	https://www.futurelearn.com/courses/the-mind-is-flat-2014

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